Issued May 1967

SOIL SURVEY

Adams County Pennsylvania

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
THE PENNSYLVANIA STATE UNIVERSITY
College of Agriculture and Agricultural Experiment Station
and the
PENNSYLVANIA DEPARTMENT OF AGRICULTURE
State Soil and Water Conservation Commission

Major fieldwork for this soil survey was done in the period 1948–61. Soil names and descriptions were approved in 1965. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1962. This survey was made cooperatively by the Soil Conservation Service, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission. It is part of the technical assistance furnished to the Adams County Soil Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY of Adams County contains information that can be applied in managing farms, orchards, and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Adams County are shown on the detailed map at the back of this report. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the report. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit and building site group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their suitability or limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the discussions of the interpretative groupings.

Foresters and others can refer to the subsection "Woodland Management," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the subsection "Use of Soils for Wildlife."

Community planners and others concerned with rural development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the subsection "Soils and Rural Developments."

Engineers and builders will find under "Engineering Uses of the Soils" tables that give engineering descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of the Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text.

Newcomers in Adams County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About Adams County," which gives general information.

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Contents

NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued May 1967

EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

Series 1957, No. 23, Las Vegas and Eldorado Valleys Area, Nev.
Series 1958, No. 34, Grand Traverse County, Mich.
Series 1959, No. 42, Judith Basin Area, Mont.
Series 1960, No. 31, Elbert County, Colo. (Eastern Part)
Series 1961, No. 42, Camden County, N.J.
Series 1962, No. 13, Chicot County, Ark.
Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF ADAMS COUNTY, PENNSYLVANIA

REPORT BY REGINALD SPEIR, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY REGINALD SPEIR, ROBERT G. GRUBB, RICHARD S. LONG, DONALD C. LEER, JOHN F. MEIER, RICHARD WEAVER, MAX COY, AND REGINALD P. PARTENHEIMER, SOIL CONSERVATION SERVICE.

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE PENNSYLVANIA STATE UNIVERSITY, COLLEGE OF AGRICULTURE AND AGRICULTURAL EXPERIMENT STATION, AND THE PENNSYLVANIA DEPARTMENT OF AGRICULTURE, STATE SOIL AND WATER CONSERVATION COMMISSION

ADAMS COUNTY (fig. 1) lies mostly in the Piedmont Province, but the northwestern part, which includes South Mountain, is in the Blue Ridge Province. The county has an area of 526 square miles, or 336,640 acres. According to the 1960 census, the population of the county was 51,906.

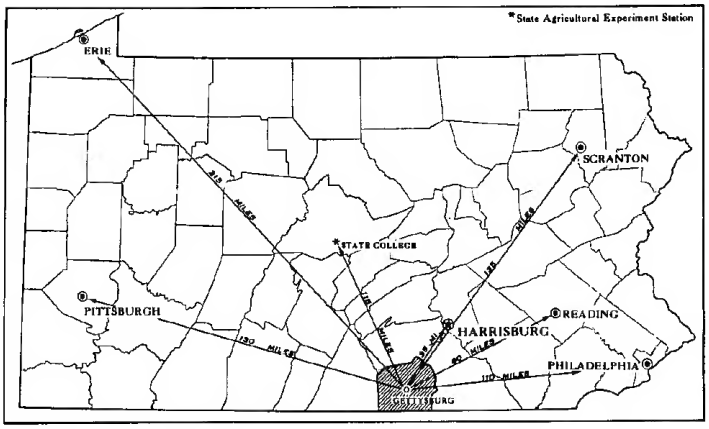

Figure 1.—Location of Adams County in Pennsylvania.

Parts of two major watersheds are in the county. About half of the county drains northward into the Susquehanna River, and the other half drains southward and westward into the Potomac River.

Adams County is mainly a farming region. The principal products are fruits, livestock, dairy, and poultry. The county ranks first in Pennsylvania in cash receipts from the sale of fruits, and it contains the largest apple-processing center in the world. Many orchards are on the foothills that border South Mountain. On the Gettysburg Plain and in the intermontane valleys, dairy farming and raising of livestock are the principal enterprises. Forest covers nearly half of the area of South Mountain and of Pigeon Hills, near the eastern edge of the county.

Gettysburg, a town of 7,960, is in the south-central part of the county and is famous for the Civil War battleground that surrounds it.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Adams County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Abbottstown and Readington, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the natural, untouched landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Edgemont channery loam and Edgemont very stony loam are two soil types in the Edgemont series. The difference in texture of their surface layers is apparent from their names.

Some types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Brecknock silt loam, 0 to 3 percent slopes, moderately eroded, is one of several phases of Brecknock silt loam, a soil type that ranges from nearly level to very steep.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

Occasionally, two or more similar soils may be mapped as a single unit, called an undifferentiated soil group, if the differences between the two soils are too small to justify separate mapping. An example in this county is Highfield and Catoctin very stony loams, 0 to 8 percent slopes.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey reports. On basis of the yield and practice tables and other data, the soil scientists set up trial groups, and then test them by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this report shows, in color, the soil associations in Adams County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in any one association may occur in another association, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of the county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in depth, stoniness, drainage, or other characteristics that affect management.

Eleven soil associations occur in Adams County. Soil association 1 and 2 are dominated by ridges and are stony. Association 3 is gravelly, and associations 4 and 5 are shaly. Soil association 6 is more rolling than association 8 and has soils that are less acid. Moderately deep, gently sloping to moderately steep soils dominate in soil association 7. The major soils in soil association 9 are much like the soils in association 11, but farming is more intensive in association 11. Association 10 consists of shallow to moderately deep soils on gently sloping to moderately steep slopes.

1. Edgemont-Highfield association: Steep, well-drained stony soils on ridges

Parallel ridges separated by narrow, discontinuous valleys dominate in this association. These ridges extend northeastward and are steep, stony, and forested. The association is in four areas in the county, the largest in the northwestern corner. The smaller areas are along the Franklin County line, in the southwestern corner of the county, and in Pigeon Hills on the eastern boundary. The total area of this association amounts to about 7 percent of the county.

Most extensive in this association are the Edgemont soils, but the Highfield soils account for a considerable acreage. The Edgemont soils are moderately deep and deep, well drained, and medium textured. They occupy the ridgetops and the upper slopes, where they are underlain by quartzite and hard sandstone. The Highfield soils developed from hard basic rock on the slopes of the ridges. Also, in the association are smaller areas of Myersville soils, Catoctin soils, and shallow sandy soils on ridges.

The main limitations to use of this association are steep slopes and stony soils. Erosion generally has been slight, but some gullying has followed logging operations, and sheet erosion has occurred where fire destroyed the protective cover. Further erosion would be likely if the soils in this association were cleared and cultivated.

2. Highfield-Myersville-Catoctin association: Hilly, well-drained, channery and stony soils on ridges

In this association steep, rugged, wooded slopes extend from fairly high, discontinuous ridges that are cut by deep lateral valleys. The association is in two widely separated areas. The larger area is in the western part of the county and extends from the Maryland State line northeastward to the Cumberland County line. The smaller area is on the eastern boundary of the county in the Pigeon Hills, which rise more than 1,000 feet above the Gettysburg Plain. This association amounts to about 11 percent of the county.

The principal soils in this association are the Highfield, Myersville, and Catoctin. The Highfield and Myersville soils developed from metabasaltic and other basic rock, and they are deep and well drained. The Catoctin soils are steeper than the Highfield and Myersville soils and are medium textured, generally stony, and shallow over basalt.

Figure 2.—**Typical landscape in Highfield-Myersville-Catoctin association along foot of South Mountain. In middle ground are Highfield soils in contour strips and contour orchards protected by diversions. In left foreground and middle ground are Myersville soils on moderate to steep slopes in contour orchards and woods. Catoctin soils are in the steeper areas of this association. Stony Edgemont soils are on the forested ridges in the background.**

About half of this association is too steep and too stony for farming. The rest, which is on long slopes facing southeastward, has been mostly cleared of native hardwoods and planted to fruit trees. Many of these orchards produce satisfactory yields of fruit. Although there is some dairying and poultry farming, orchards dominate in this association. Local plants process the fruit. Erosion is the main problem in the orchards and in areas used for cultivated crops. Figure 2 shows a typical landscape in this association.

3. Arendtsville-Highfield association: Dominantly rolling, well-drained gravelly soils that have slopes ranging from gentle to steep.

This association is characterized by rolling topography in which uneven, complex slopes range from gently sloping to steep. It covers the southeastern slopes of South Mountain and extends from the west-central part of the county near Cashtown northeastward to the northern boundary. The association occupies about 20,000 acres and amounts to about 6 percent of the county.

Arendtsville soils are dominant, but small areas of Highfield, Montalto, and Penn soils also occur. The Arendtsville soils were derived from Arendtsville fanglomerate, which consists of pebbles of schist and basic rock in a matrix of reddish-brown silt and sand. These soils are deep, well drained, and gravelly. Many areas of these soils have excellent air drainage, and the soils permit deep rooting and are high in available moisture capacity.

Favorable yields of cherries, apples, and peaches are common in this association. Row crops also produce favorable yields, but careful management is required because slopes are uneven and stones or pebbles are on the surface. Some of the steeper slopes are wooded, and the small narrow valleys along streams are generally in hay and pasture.

4. Penn-Readington-Croton association: Gently sloping to moderately sloping, shallow to moderately deep shaly soils

This association, the largest in the county, consists of shaly soils that are low in natural fertility but are easy to farm because slopes are mild. The association is in a lowland area and is one of the most important agricultural regions in the county. It extends northeastward in two long, parallel belts in the central part of the county. This association makes up 26 percent of the county.

Penn soils dominate in this association, but a considerable acreage of Readington and Croton soils also occurs, and there are smaller areas of Klinesville, Abbottstown, Reaville, Lehigh, and Brecknock soils. Penn soils are moderately deep, well drained, and medium textured. They have inherited their reddish color from the underlying shale and sandstone. In the more nearly level areas and along drainageways are the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. Klinesville soils are on steeper slopes than Penn soils and are shallow or very shallow to hard shale. Figure 3 shows the major soils and underlying material in this association.

Crop yields in this association are generally moderate to low because the soils are low in natural plant nutrients, shallow to shale, and moderate to low in moisture available to plants. Also, the soils are susceptible to erosion, and many of the steeper slopes are severely eroded. However, adequate yields of alfalfa, corn, small grain, hay, and pasture can be produced if management is good and includes heavy fertilization.

5. Klinesville-Penn-Abbottstown-Croton association: Gently sloping to moderately sloping, mostly shallow shaly soils that are well drained to poorly drained

In this association the low hills and broad gentle slopes of the Gettysburg Plain are broken by short steep slopes along streams. The association extends northeastward through the county in a narrow belt that is just west of Gettysburg. The soils are generally shallow, but they range from very shallow to moderately deep. They are very shallow on steep slopes and are moderately deep on gentle slopes. Drainage is poor in many places. This association occupies about 7 percent of the county.

Of the major soils in this association, the Klinesville are shallow to very shallow over shale, and the Penn are moderately deep to shallow. The Abbottstown are somewhat poorly drained, and the Croton are poorly drained. The Croton soils are along drainageways and in nearly level areas. Also in the association are the moderately well drained Readington soils and the somewhat poorly drained Reaville soils. The Reaville soils are shallow over bedded shale. Frequent, heavy runoff in this area of shallow and wet soils causes erosion, even on gentle slopes.

More than 90 percent of this association has been cleared and farmed. Most farms are diversified and produce some

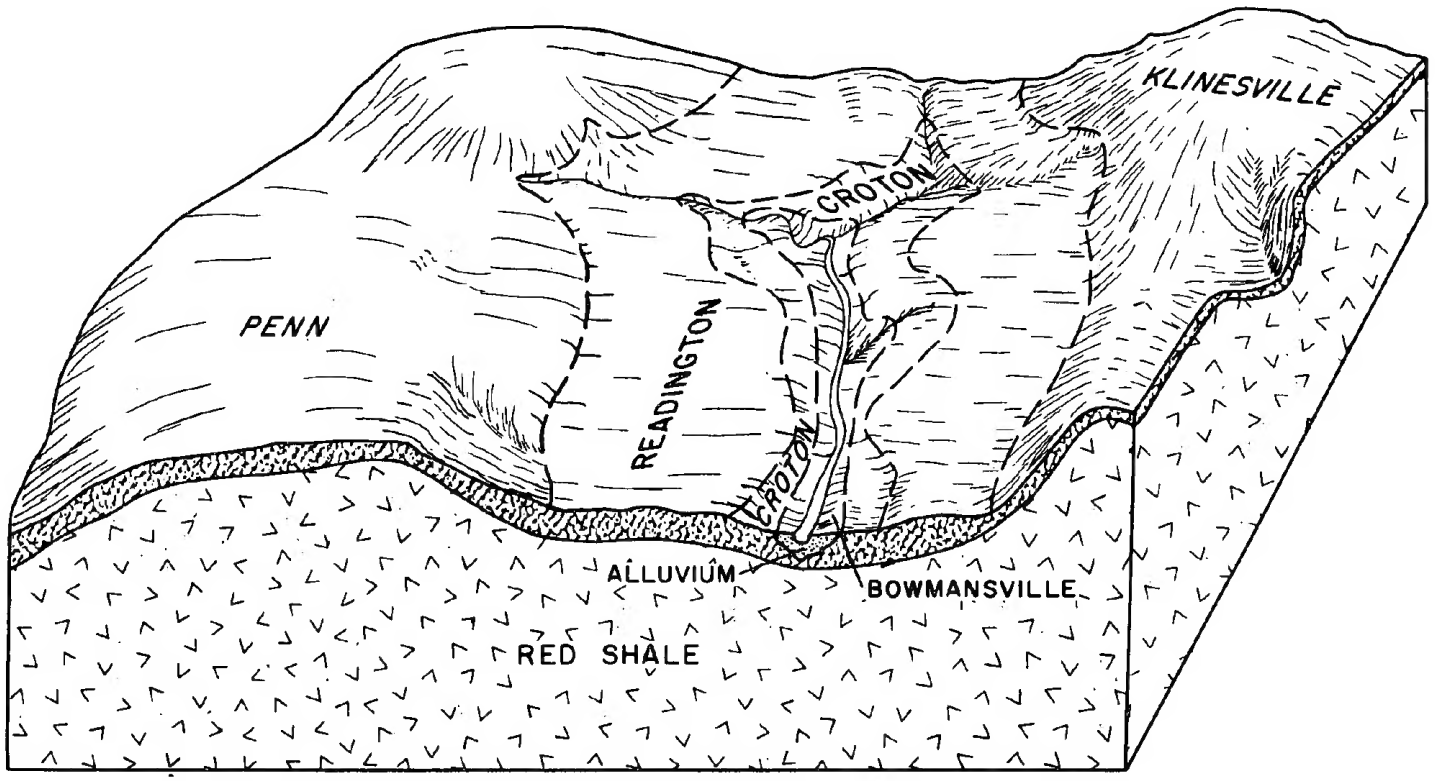

Figure 3.—**Major soils in the Penn-Readington-Croton association and their underlying material.**

dairy products and poultry, but there are a few livestock farms. Because of poor yields and difficult management, some fields have been left idle in recent years. Most of this association is suited to adapted grasses and legumes.

6. Montalto-Mount Lucas-Watchung association: Rolling to gently sloping, medium acid soils

Almost all of this association is in a belt of low ridges that begins at the northeastern boundary of the county, passes the Civil War battleground southeast of Gettysburg, and extends to the Maryland State line. Then this belt hooks northwestward and extends to the central part of the county. The few other areas of this association are very small and widely scattered. Many large boulders of diabase rock occur on the more prominent ridges. In the more rugged sections, the diabase ridges have rounded knobs or hills that rise abruptly from the surrounding plain, as does Round Top in the Gettysburg National Military Park. This association amounts to about 9 percent of the county.

Dominant in this association are the deep, well drained Montalto soils, the moderately well drained Mount Lucas soils, and the poorly drained Watchung soils. Legore soils are also in the association and are shallow or moderately deep to weathered rock, or saprolite.

Many areas are too stony for farming, but cleared fields of Montalto soils produce satisfactory crop yields. Drainage is generally needed on the Mount Lucas soils. The Watchung soils are better used for pasture, woodland, or wildlife than for row crops.

7. Lehigh-Brecknock association: Gently sloping to moderately steep, moderately deep soils

This association extends in a narrow band that borders the diabase ridges of the Montalto-Mount Lucas-Watchung association. It is also in many small bands within the red shale area where the diabase intrusions are at the surface in many places. This association makes up about 10 percent of the county.

The somewhat poorly drained and moderately well drained Lehigh soils are most extensive in this association, but the well drained Brecknock soils have a considerable acreage. The soils of both series are sometimes called blue slate soils because the metamorphosed shale imparted to them its bluish-gray color. Below the plow layer the Lehigh soils have a siltpan that retards drainage and root penetration. Also in this association are the poorly drained Croton soils.

Most of the association is used for dairy farming and general farming. Normally, crop yields are only fair.

8. Penn-Lansdale-Abbottstown association: Gently sloping to moderately sloping, strongly acid soils that are mostly well drained or somewhat droughty

Gently sloping to moderately rolling topography dominates this association, but east of Bonneauville there is a broad, nearly level area. The association is in the southeastern part of the county in a belt about 5 miles wide. It extends northeastward from the Maryland State line to the York County line. The association occupies about 14 percent of the county.

Penn and Lansdale soils cover the largest area, but the area of Abbottstown soils is considerable. The Penn soils are moderately deep or shallow and well drained and are underlain by red sandstone, siltstone, and shale. The Lansdale soils are moderately deep or deep and well drained and are underlain by gray or yellow sandstone or conglomerate. The Abbottstown soils are somewhat

poorly drained. Also in this association are the shallow sandy Steinsburg soils on the steeper slopes and ridges, the moderately well drained Readington soils, the poorly drained Croton soils, and small areas of the shaly Klinesville soils.

This association is used almost entirely for corn, small grain, hay, and pasture. Severe erosion is common, and generally yields are only fair.

9. Conestoga-Wiltshire-Lawrence association: Mostly deep, gently sloping, medium acid and slightly acid soils

Gently sloping areas of deep, well-drained soils make up most of this association, but some areas are in moderately well drained to somewhat poorly drained lowlands. The association is in the southeastern part of the county in a fairly level limestone valley that extends from Littlestown northeastward to McSherrystown and the York County line. Elevations range from 500 to 600 feet. The association occupies about 5 percent of the county.

In the higher areas of this association are the dominant Conestoga soils (fig. 4). These soils are deep and well drained. In the lower areas and along drainageways are the moderately well drained Wiltshire soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils. The flood plains are occupied by the moderately well drained and somewhat poorly drained Lindside soils, the poorly drained Melvin soils, and the very poorly drained Dunning soils. Most of the soils in this association developed from limestone and calcareous schist and are high in natural fertility and in available moisture capacity.

***Figure 4.*—Typical landscape in the Conestoga-Wiltshire-Lawrence association. Conestoga soils are in the foreground and the Pigeon Hills are in the background.**

Although soils in this area are susceptible to erosion, it has been severe only on the steepest slopes. A shallow, severely eroded band occurs just west and adjacent to the south branch of Conewago Creek.

This association is used as cropland and pasture. Dairy farming is the major enterprise, but some vegetables are grown commercially.

Many farms north of McSherrystown have been purchased for their limestone, but the former owners are allowed to live on the land and farm it until the quarry opens. The horseracing stables south of McSherrystown are famous throughout the country. The soils in this area are used mostly for improved pasture. Between Hanover, in York County, and McSherrystown the amount of land used for residential and industrial sites is increasing. Little woodland or idle land is in this association.

10. Glenelg-Manor-Glenville association: Shallow to moderately deep, mostly well-drained soils on gently sloping to moderately steep slopes

This association is in the extreme southeastern corner of the county in an area that is generally moderately sloping. The association amounts to about 3 percent of the county (fig. 5).

***Figure 5.*—Typical landscape of Glenelg-Manor-Glenville association southeast of Littlestown near the York County line.**

The most extensive soils in this association are the Glenelg and Manor, but Glenville soils also occur. The Glenelg and Manor soils developed in residuum from schist, phyllite and gneiss. The Glenelg soils are gently sloping to moderately sloping and have a moderately thick solum. The shallow Manor soils are on the steeper slopes, and the moderately well drained Glenville soils are along the drainageways in seepy areas at the foot of slopes. Also in the drainageways are the poorly drained Worsham soils.

The soils in this association have had severe accelerated erosion and are highly susceptible to further erosion. The available moisture capacity is moderate to high.

Dairy, poultry, and vegetable farms are common in the area. Crop yields are favorable.

11. Athol-Wiltshire-Readington association: Deep, gently sloping, medium acid and slightly acid soils that are intensively farmed

Gently sloping, intensively farmed soils make up most of this association. The largest area is the nearly level lowland of the valley around Fairfield. The total acreage amounts to about 2 percent of the county.

Most extensive in this association are the deep or very deep, well-drained Athol soils. These soils formed on limestone conglomerate and from gravelly alluvium that washed from the mountains. Also in this association are the moderately well drained Wiltshire and Readington soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils. The Penn, Montalto, and Brecknock soils are in small areas.

Dairying is the principal farming enterprise. The soils are used mainly for pasture, hay, and general crops, and some fruit is grown on the higher slopes. Yields of adapted crops are generally satisfactory.

Use and Management of the Soils

The soils of Adams County are used mainly for cultivated crops, for fruit orchards, and for pasture and hay. This section tells how the soils may be managed for these main purposes and also for woodland, for wildlife, for building highways, farm ponds, and other engineering structures, and for rural development. It also gives predicted relative productivity under two levels of management. The method of presenting information is that of grouping the soils that require similar management, describing the group, and suggesting suitable management or pointing out hazards to management. In the subsection on engineering, the soils are not grouped but are placed in tables so that properties significant to engineering work can be readily given.

In using the soils of the county for farming, each acre should be used for the purpose best suited and should be managed according to its need. The farmer will benefit if he—

1. Uses practices for controlling erosion and water that, on sloping soils, include contour stripcropping, graded stripcropping, building terraces, and building waterways.
2. Develops an efficient system of water disposal.
3. Uses bedding, drainage ditches, or tile where drainage is needed.
4. Plants crops and varieties of crops adapted to the soils and the climate.
5. Reduces compaction by minimum tillage, regulating field traffic, plowing only when the content of moisture is favorable, and permitting grazing only when the soils are not wet.
6. Selects a cropping system that helps to control erosion, to maintain the supply of organic matter, and to improve soil structure.
7. Uses cover crops, crop residues, and manure to protect the surface against erosion.
8. Adds additional organic matter to conserve moisture and maintain soil structure.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soils are grouped at three levels; the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes, there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no risk of erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are capability units, which are groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe–2 or IIIe–3.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows.

Class I. Soils that have few limitations that restrict their use.
(No subclasses)
Capability unit I–1. Mostly deep, well-drained, nearly level soils on uplands.
Capability unit I–2. Deep, well-drained, nearly level soils on flood plains.

Class II. Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.
Subclass IIe. Soils subject to moderate erosion if they are not protected.
Capability unit IIe–1. Deep, well-drained, nearly level and gently sloping soils.
Capability unit IIe–2. Moderately deep and deep, well-drained, nearly level and gently sloping soils.
Capability unit IIe–3. Mostly moderately deep or shallow, well-drained, nearly level and gently sloping soils that have moderate to moderately low available moisture capacity.
Capability unit IIe–4. Shallow to deep, well-drained, gently sloping soils that have moderate or low available moisture capacity, and are moderately eroded.

Capability unit IIe–5. Moderately deep and deep, moderately well drained, nearly level and gently sloping soils.

Subclass IIw. Soils that have moderate limitations because of excess water.

Capability unit IIw–1. Deep and moderately deep, moderately well drained, nearly level soils on uplands and stream terraces.

Capability unit IIw–2. Deep, moderately well drained, nearly level soils on flood plains.

Class III. Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.

Capability unit IIIe–1. Deep, well-drained, gently sloping and moderately sloping soils.

Capability unit IIIe–2. Moderately deep and deep, well-drained, moderately sloping soils.

Capability unit IIIe–3. Shallow and moderately deep, well-drained, gently sloping and moderately sloping soils that have low to moderately high available moisture capacity.

Capability unit IIIe–4. Shallow, well-drained, nearly level and gently sloping soils that have low available moisture capacity and are moderately eroded.

Capability unit IIIe–5. Moderately deep and deep, moderately well drained, moderately sloping soils.

Subclass IIIw. Soils that have a severe limitation because of excess water.

Capability unit IIIw–1. Moderately deep and deep, moderately well drained to poorly drained, level to gently sloping soils.

Capability unit IIIw–2. Mostly shallow, somewhat poorly drained, nearly level and gently sloping soils.

Capability unit IIIw–3. Deep, somewhat poorly drained to very poorly drained, nearly level soils on flood plains.

Class IV. Soils that have very severe limitations that restrict the choice of plants, or require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–1. Moderately deep and deep, well-drained, moderately sloping to strongly sloping soils.

Capability unit IVe–2. Shallow and moderately deep, well-drained, moderately sloping to strongly sloping soils that have moderately low or low available moisture capacity.

Capability unit IVe–3. Shallow and moderately deep, well-drained soils that have low available moisture capacity and are severely eroded.

Capability unit IVe–4. Shallow and moderately deep, moderately well drained and somewhat poorly drained, gently sloping to moderately sloping soils that have low available moisture capacity.

Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.

Capability unit IVw–1. Deep, poorly drained, nearly level soils.

Capability unit IVw–2. Moderately deep and deep, poorly drained, gently sloping and moderately sloping soils.

Class V. Soils not likely to erode, that have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass Vw. Soils too wet for cultivation; drainage or protection not feasible.

Capability unit Vw–1. Deep, poorly drained, nearly level soils that are very slowly permeable.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass VIe. Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIe–1. Shallow to deep, well-drained, moderately steep soils that are severely eroded.

Capability unit VIe–2. Shallow, well-drained, moderately sloping to steep soils that are severely eroded.

Capability unit VIe–3. Moderately deep and deep, well-drained, moderately steep to steep soils.

Capability unit VIe–4. Shallow, somewhat poorly drained, moderately sloping soils that are severely eroded.

Subclass VIw. Soils severely limited by excess water and generally unsuitable for cultivation.

Capability unit VIw–1. Deep and moderately deep, poorly drained, gently sloping soils.

Subclass VIs. Soils generally unsuitable for cultivation and limited for other uses by their moisture capacity, stones, or other features.

Capability unit VIs–1. Deep and moderately deep, well-drained, nearly level to moderately steep soils that are very stony.

Capability unit VIs–2. Moderately deep and deep, moderately well drained and somewhat poorly drained, level to strongly sloping soils that are very stony.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation, without major reclamation, and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Capability unit VIIe–1. Shallow to deep, well-drained, strongly sloping to steep soils.

Subclass VIIs. Soils very severely limited by moisture capacity, stones, or other soil features.

Capability unit VIIs–1. Deep and moderately deep, well-drained, steep and very steep soils that are very stony.

Capability unit VIIs–2. Poorly drained, nearly level to gently sloping soils that are very stony.

Class VIII. Soils and landforms that, without major reclamation, have limitations that preclude their use for commercial production of plants and that restrict their

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use to recreation, wildlife, water supply, or esthetic purposes. (No soil of Adams County is in class VIII.)

Management by capability units

The soils in one capability unit have about the same limitations and are subject to similar risks of damage. All the soils in one unit, therefore, need about the same kind of management.

The capability units are described in the following pages. For each unit, the soils are listed and suitable management is suggested. Further information concerning management can be obtained from a local representative of the Soil Conservation Service or from the county agricultural agent. Proper guidance can also be obtained on how to take and prepare soil samples for tests that indicate the needs for lime and fertilizer for a particular crop.

Suitable cropping systems are described for some units in terms of very high, high, medium, low, and very low intensity. The intensity of these systems is defined as follows:

Very high intensity: continuous row crops.
High intensity: 2 years of row crops, 1 year of a small grain, and 1 year of hay.
Medium intensity: a row crop, a small grain, and hay, each grown for 1 year.
Low intensity: 1 year of a row crop, 1 year of a small grain, and 2 years of hay or pasture.
Very low intensity: 1 year of a row crop, 1 year of a small grain, and 3 or more years of hay or pasture.

CAPABILITY UNIT I–1

The soils in this capability unit occur on uplands and are mostly deep, well drained, and nearly level. They developed in weathered fanglomerate, calcareous rock, diabase, and schist and in weathered shale and sandstone deposited in old streambeds. These soils have good structure and range from very strongly acid to slightly acid. They range from moderate to high in available moisture capacity and in their ability to supply and hold plant nutrients. The soils are—

Arendtsville gravelly loam, 0 to 3 percent slopes.
Birdsboro silt loam, 0 to 3 percent slopes.
Glenelg silt loam, 0 to 3 percent slopes.
Montalto silt loam, 0 to 3 percent slopes.

All of these soils except the Montalto have a rapidly permeable subsoil; the Montalto soil has a moderately slowly permeable subsoil. The Glenelg soil is only moderately deep to saprolite and in dry periods is more likely to be droughty than are the other soils. In some places the Montalto soil has stones on the surface that interfere with cultivation. Pebbles in the gravelly Arendtsville soil slightly hinder some farm operations.

Crops on these soils respond well to management and, if management is good, some of the most favorable yields in the county are produced. A cropping system of very high intensity can be used. Corn, potatoes, bush fruits, small grain, alfalfa, and similar crops can be grown continuously. Planting cover crops, adding manure, and mixing crop residue into the soil help to maintain organic-matter content and soil structure. Fertilizer and lime should be applied in amounts indicated by soil tests. On slopes of more than 2 percent, contour farming is generally necessary for conserving moisture and controlling erosion. Areas in bush fruits should be mulched or planted to a winter cover crop; either practice helps to maintain organic matter and soil structure and to conserve moisture.

CAPABILITY UNIT I–2

Bermudian silt loam is the only soil in this capability unit. This soil is on flood plains and is deep, well drained, and nearly level. It is medium acid or strongly acid. Flooding and silting are likely, but there is little or no risk of erosion. This soil has high available moisture capacity.

This soil is easy to cultivate. It is suitable for cropping systems of very high intensity. Crops that can be grown continuously are corn, small grain, and alfalfa. Planting cover crops, adding manure, and returning crop residue to the soil help to maintain soil structure and organic-matter content. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IIe–1

This capability unit consists of deep, well-drained, nearly level and gently sloping soils that are moderately eroded and in some areas have lost almost three-fourths of their original surface soil. These soils are permeable and have high available moisture capacity. They range from strongly acid to neutral. The soils are—

Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded.
Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded.
Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded.
Conestoga silt loam, 0 to 3 percent slopes, moderately eroded.
Conestoga silt loam, 3 to 8 percent slopes, moderately eroded.
Montalto silt loam, 3 to 8 percent slopes, moderately eroded.

These soils are easy to cultivate, and they produce satisfactory yields. They are suitable for cropping systems of high intensity. One such system is 2 years of row crops, 1 year of small grain, and 1 year of hay. Suitable crops are corn, potatoes, small grain, alfalfa, and orchardgrass. If row crops are grown for 2 successive years, cover crops are needed to help control erosion. Adding manure and returning crop residue to these soils help to maintain soil structure, provide additional organic matter, and conserve moisture. Fertilizer and lime should be applied in amounts indicated by soil tests. Excessive erosion can be controlled by using cropland terraces or contour stripcropping, diversion terraces, and waterways.

CAPABILITY UNIT IIe–2

This capability unit consists of moderately deep and deep, well-drained, nearly level and gently sloping soils that are slightly eroded or moderately eroded. These soils formed in material weathered from acid rock. They are permeable and have moderately high available moisture capacity. Their natural fertility is moderate to high. The soils are—

Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded.
Edgemont channery loam, 3 to 8 percent slopes.
Glenelg silt loam, 3 to 8 percent slopes, moderately eroded.
Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded.
Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded.
Myersville silt loam, 0 to 3 percent slopes, moderately eroded.
Myersville silt loam, 3 to 8 percent slopes, moderately eroded.

These soils are suitable for cropping systems of high intensity. The Highfield and Edgemont soils are chan-

nery and in some places may be slightly difficult to manage. A suitable cropping system is 2 years of row crops, 1 year of small grain, and 1 year of hay. Suitable crops are corn, potatoes, bush and tree fruits, small grain, alfalfa, and orchardgrass. If row crops are grown for 2 successive years, cover crops are needed to help control erosion. Adding manure and returning crop residue to these soils help to maintain soil structure, provide additional organic matter, conserve moisture, and control erosion. Fertilizer and lime should be applied in amounts indicated by soil tests. Cropland terraces or contour stripcropping, diversion terraces, and waterways help to control excessive soil washing.

Orchards should be kept in permanent sod or cover crops, and trashy cultivation is needed for conserving soil and moisture. Diversion terraces are needed on long slopes so that water can be managed efficiently. Areas in fruit bushes should be mulched or seeded to a winter cover crop to help control erosion, maintain soil structure, and conserve moisture.

CAPABILITY UNIT IIe-3

The soils in this capability unit are mostly shallow or moderately deep, well drained, and nearly level or gently sloping. They developed mostly in weathered shale, sandstone, porcelanite, or schist. These soils range from slightly acid to very strongly acid. They are permeable, are moderate to moderately low in available moisture capacity, and therefore are droughty. The soils are—

Brecknock silt loam, 0 to 3 percent slopes, moderately eroded.
Brecknock silt loam, 3 to 8 percent slopes, moderately eroded.
Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded.
Lansdale loam, 0 to 3 percent slopes, moderately eroded.
Lansdale loam, 3 to 8 percent slopes, moderately eroded.
Manor loam, 3 to 8 percent slopes, moderately eroded.
Penn silt loam, 0 to 3 percent slopes, moderately eroded.
Penn silt loam, 3 to 8 percent slopes, moderately eroded.

These soils are easy to cultivate. They are suitable for a cropping system of medium intensity that consists of a row crop, a small grain, and hay. Suitable crops are corn, small grain, alfalfa, and orchardgrass. The crop varieties planted should be drought resistant. A cover crop seeded after the row crop or the small grain is harvested helps control erosion. Adding manure and returning crop residue to these soils help to control erosion and to maintain soil structure and organic-matter content. Fertilizer and lime should be added in amounts indicated by soil tests. Contour stripcropping, diversion terraces, and waterways are needed to help control excessive soil washing.

CAPABILITY UNIT IIe-4

This capability unit consists of shallow to deep, well-drained, gently sloping soils that are moderately eroded and are highly susceptible to further erosion. Some areas have lost as much as three-fourths of the original surface layer. These soils were derived from diabase or calcareous schist. They range from slightly acid to strongly acid. Permeability is moderate or moderately rapid, and the available moisture capacity is moderate or low. These soils are subject to drought in dry periods. Natural fertility is moderate or high. The soils are—

Hollinger silt loam, 3 to 8 percent slopes, moderately eroded.
Legore channery silt loam, 3 to 8 percent slopes, moderately eroded.

These soils are suited to a cropping system of low intensity that consists of a row crop, a small grain, and 2 years of hay. Suitable crops are drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. If corn or spring-sown small grain is grown, a cover crop should be seeded after the crop is harvested. Adding manure and returning crop residue to these soils help to control erosion, maintain soil structure and organic-matter content, and conserve moisture. Fertilizer and lime should be applied in amounts indicated by soil tests. Excessive erosion can be controlled by contour stripcropping, diversion terraces, and waterways.

CAPABILITY UNIT IIe-5

The soils in this capability unit are moderately deep and deep, moderately well drained, and nearly level to gently sloping. They formed in material weathered from calcareous rock, acid rock, or basic rock. These soils have a moderately permeable or a moderately slowly permeable subsoil, and they can hold a moderate to large amount of moisture and plant nutrients. They range from very strongly acid to neutral. The soils are—

Buchanan gravelly silt loam, 3 to 8 percent slopes.
Glenville silt loam, 3 to 8 percent slopes.
Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded.
Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded.
Readington silt loam, 3 to 8 percent slopes, moderately eroded.
Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded.

Natural fertility is high in the Wiltshire soil, moderate to high in the Mount Lucas, Glenville, and Buchanan soils, and low to moderate in the Readington soils.

The soils in this unit are suited to a cropping system of medium intensity. One such system is a row crop, a small grain, and hay, each grown for 1 year. Suitable crops are corn, small grain, orchardgrass, and moisture-tolerant varieties of alfalfa. After corn or spring-sown small grain is harvested, a cover crop should be seeded to help control erosion, maintain soil structure and organic-matter content, and conserve moisture. Fertilizer and lime should be applied in amounts indicated by soil tests. Graded stripcropping, diversion terraces, and waterways help to control excessive erosion. Surface drainage and random tile are needed in some places.

CAPABILITY UNIT IIw-1

This capability unit consists of deep and moderately deep, moderately well drained, nearly level soils on uplands and stream terraces. These soils formed in material weathered from acid and basic rock. They range from very strongly acid to neutral. They have a moderately permeable or moderately slowly permeable subsoil, and they can hold a moderate to high amount of available moisture and plant nutrients. The water table is high in winter and early in spring, particularly in depressions and in level areas. The soils are—

Buchanan gravelly silt loam, 0 to 3 percent slopes.
Glenville silt loam, 0 to 3 percent slopes.
Readington silt loam, 0 to 3 percent slopes.
Readington and Wiltshire silt loams, 0 to 3 percent slopes.

Natural fertility is high in the Wiltshire soil, moderate to high in the Glenville and Buchanan soils, and low to moderate in the Readington soils.

A suitable cropping system of high intensity can be used on these soils. One such system is 2 years of row crops, 1

year of small grain, and 1 year of hay. A winter cover crop or winter grain should be seeded after the row crop is harvested. Suitable crops are corn, orchardgrass, and moisture-tolerant alfalfa. Drained areas are suited to tomatoes, potatoes, and winter grain. Leaving large amounts of crop residue and adding manure help to control excessive erosion and to maintain soil structure and organic-matter content. Fertilizer and lime should be applied in amounts indicated by soil tests. Graded rows, surface ditches, and random tile are needed to dispose of surplus water and control excessive erosion.

CAPABILITY UNIT IIw-2

This capability unit consists of deep, moderately well drained, nearly level soils on flood plains. These soils formed in material weathered from acid or basic rock. They are subject to occasional flooding, particularly in winter and early in spring, but the flooding generally does not last long. However, it may cause scouring. These soils have a seasonally high water table and moderately high to high capacity for storing moisture and plant nutrients. They are slightly acid to strongly acid. Natural fertility is moderately high. The soils are—

Chewacla silt loam.
Melvin and Lindside silt loams (Lindside soil only).
Rowland silt loam.

Permeability is moderately rapid in the Chewacla soil, moderate in the Rowland soil, and moderately slow or slow in the Lindside soil.

Cultivation is generally easy on the soils of this unit, but some areas require tile lines, open ditches, and drainage terraces. A cropping system of high intensity can be used if crops are planted that are not damaged by the high water table. One such system is 2 years of row crops, 1 year of a small grain, and 1 year of hay. Suitable crops are corn, small grain, red clover, and timothy. If row crops are grown for 2 successive years, a cover crop should be planted after each crop is harvested. The cover crop helps to reduce scouring and to maintain organic-matter content. Crop residue that is returned to the soil should not be disked or shredded until the soil is ready for plowing. Fertilizer and lime should be added in amounts indicated by soil tests.

CAPABILITY UNIT IIIe-1

The soils in this capability unit are deep, well drained, and gently sloping to moderately sloping. They formed in material weathered from limestone, calcareous schist, or diabase or in a mixture of weathered acid material. These soils have lost from one-fourth to three-fourths or more of their original surface soil. They are moderate to high in available moisture capacity and have moderately slow to moderately rapid permeability. They range from slightly acid to strongly acid. Natural fertility is moderately high or high. The soils are—

Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded.
Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded.
Conestoga silt loam, 3 to 8 percent slopes, severely eroded.
Conestoga silt loam, 8 to 15 percent slopes, moderately eroded.
Montalto silt loam, 8 to 15 percent slopes, moderately eroded.

Permeability is moderate in the Athol soil, moderately slow in the Montalto soil, and moderately rapid in the Birdsboro and Conestoga soils.

The soils in this unit are easy to cultivate. They are suitable for a cropping system of medium intensity that consists of a row crop, a small grain, and hay, each grown for 1 year. Suitable crops are corn, small grain, alfalfa, and orchardgrass. If winter grain is not grown, seeding a cover crop after the row crop is harvested and returning large amounts of crop residue to the soil help to control erosion, to conserve moisture, and to maintain organic-matter content and soil structure. Contour stripcropping, diversion terraces, and waterways are also needed to help control erosion. Fertilizer and lime should be applied in amounts indicated by soils tests.

CAPABILITY UNIT IIIe-2

This capability unit consists of moderately deep and deep, well-drained, moderately sloping soils that are slightly eroded or moderately eroded. These soils developed mostly from acid material and range from medium acid to very strongly acid. They range from moderately low to high in their capacity to hold moisture and plant nutrients. Natural fertility is moderately low to high. The soils are—

Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded.
Edgemont channery loam, 8 to 15 percent slopes.
Glenelg silt loam, 8 to 15 percent slopes.
Glenelg silt loam, 8 to 15 percent slopes, moderately eroded.
Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded.
Myersville silt loam, 8 to 15 percent slopes, moderately eroded.

Permeability is moderately rapid in all of these soils except the Myersville and is moderate in the Myersville soil.

These soils are suited to a cropping system of medium intensity that consists of a row crop, a small grain, and hay, each grown for one year. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. If grain is not seeded in fall after the row crop is harvested, a cover crop is needed to help control erosion. Adding manure and returning large amounts of crop residue to the soil also help to control erosion, as well as to conserve moisture and to maintain soil structure and organic-matter content. Also needed to help control erosion are contour stripcropping, diversion terraces, and waterways. Fertilizer and lime should be added in amounts indicated by soil tests.

Orchards should be kept in permanent sod or cover crops, and they need trashy cultivation for conserving moisture and soil. Diversion terraces are needed on long slopes so that water can be managed efficiently. Areas in bush fruits should be mulched or seeded to a winter cover crop to help control erosion, maintain soil structure, and conserve moisture.

CAPABILITY UNIT IIIe-3

This capability unit consists of shallow and moderately deep, well-drained, gently sloping to moderately sloping soils that are moderately eroded or severely eroded. Some areas have lost more than three-fourths of their original surface soil. These soils can hold a small to moderately large amount of moisture and plant nutrients. The soils are—

Brecknock silt loam, 3 to 8 percent slopes, severely eroded.
Brecknock silt loam, 8 to 15 percent slopes, moderately eroded.

Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded.
Lansdale loam, 3 to 8 percent slopes, severely eroded.
Lansdale loam, 8 to 15 percent slopes, moderately eroded.
Legore channery silt loam, 8 to 15 percent slopes, moderately eroded.
Manor loam, 8 to 15 percent slopes, moderately eroded.
Penn silt loam, 3 to 8 percent slopes, severely eroded.
Penn silt loam, 8 to 15 percent slopes, moderately eroded.

All of these soils except the Legore formed in acid parent material and range from slightly acid to very strongly acid. The Legore soil formed in material weathered from diabase and is less acid than the other soils. Permeability is moderately rapid in the Catoctin, Lansdale, and Manor soils and moderate in the Penn, Brecknock, and Legore soils.

The Catoctin and Legore soils and some areas of the Manor and Brecknock soils are channery and are more difficult to cultivate than the other soils in this unit. Crops can be grown on all these soils if the cropping system is of low intensity. A suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 2 years of hay. Suitable crops are drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. If winter grain is not grown, a cover crop seeded after the row crop is harvested helps to control excessive erosion. Adding manure and returning large amounts of crop residue to the soil help to control erosion, to conserve moisture, and to maintain organic-matter content and soil structure. Also helpful in controlling erosion are contour stripcropping, diversion terraces, and waterways. Fertilizer and lime should be added in amounts indicated by soil tests.

CAPABILITY UNIT IIIe-4

This capability unit consists of shallow, well-drained, nearly level and gently sloping soils that are moderately eroded. These soils developed in material weathered from sandstone, shale, or acid conglomerate. They range from medium acid to very strongly acid. These soils are droughty for they have low available moisture capacity. They are permeable and contain many coarse fragments. The soils are—

Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded.
Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded.
Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded.

These soils are suited to a cropping system of low intensity that consists of a row crop, a small grain, and 2 years of hay. Suitable crops are drought-resistant varieties of winter grain, alfalfa, and orchardgrass, but corn is poorly suited. If row crops are grown, adding manure and returning crop residue to these soils are ways to control erosion and conserve moisture. Also helpful in controlling erosion are contour stripcropping, diversion terraces, and waterways. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IIIe-5

Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded, is the only soil in this capability unit. This soil is moderately deep or deep and moderately well drained. It developed in material weathered from diabase and is slightly acid or medium acid. This soil has a permeable surface layer and a moderately slowly permeable subsoil, and it can hold a moderate to large amount of available moisture and plant nutrients.

This soil is moderately productive if practices to control erosion and water are used. The cropping system should be of low intensity—a row crop, a small grain, and 2 years of hay. Suitable crops are corn, small grain, red clover, ladino clover, and timothy. Adding manure and mixing crop residue into the soil help to control erosion and to maintain soil structure and the content of organic matter. Graded stripcropping, diversion terraces, and waterways are needed to dispose of surplus water and to help control erosion. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IIIw-1

This capability unit consists of moderately deep and deep, moderately well drained to poorly drained, level to gently sloping soils, some of which are moderately eroded. These soils formed in material weathered from calcareous or acid metamorphosed rock. They range from very strongly acid to neutral. Their moderately slowly permeable or slowly permeable subsoil retards drainage and the penetration of roots. These soils have a moderate to high capacity for holding available moisture and plant nutrients. The water table is seasonally high. The soils are—

Abbottstown silt loam, 0 to 3 percent slopes.
Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded.
Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded.
Bowmansville silt loam, local alluvium, 0 to 3 percent slopes.
Bowmansville silt loam, local alluvium, 3 to 8 percent slopes.
Lawrence silt loam.
Lehigh silt loam, 0 to 3 percent slopes.
Lehigh silt loam, 3 to 8 percent slopes, moderately eroded.
Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes.
Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes.
Rohrersville silt loam, 0 to 3 percent slopes.
Rohrersville silt loam, 3 to 8 percent slopes.

These soils are moderately productive, but stones interfere with cultivation on the Mount Lucas, Rohrersville, and Lehigh soils in some places. Crops can be grown on all the soils of this unit in a cropping system of low intensity that consists of a row crop, a small grain, and 2 years of hay. Suitable crops are corn, winter small grain, birdsfoot trefoil, ladino clover, and timothy. Drainage is the most serious problem of management. In level areas bedding is generally needed to dispose of surface water. Spots that remain wet should be drained with tile where possible. Also helpful in disposing of excess water, and in controlling erosion, are stripcropping, diversion terraces, and waterways. Adding manure and mixing crop residue into the soil help to maintain soil structure and the content of organic matter. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IIIw-2

The soils in this capability unit are mostly shallow, somewhat poorly drained, and nearly level to gently sloping. They formed in material weathered from acid, red and gray shale and sandstone. They range from medium acid to very strongly acid. These soils are low in available moisture capacity and in their capacity to hold plant nutrients. They are subject to drought in dry periods but

are excesssively wet during periods of high rainfall. The soils are—

Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded.
Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded.

These soils are not suited to row crops, but they are suited to small grain, birdsfoot trefoil, red clover, and timothy, used in a cropping system of low intensity. Crop yields are low. Fertilizer and lime should be applied in amounts indicated by soil tests. Drainage is generally needed in the nearly level areas. Because these soils are shallow to hard shale, tile drains are not generally effective. Nevertheless, spots that remain wet should be drained with tile where possible. Graded stripcropping is needed to help control erosion. On the longer slopes diversion terraces help to control excess runoff.

CAPABILITY UNIT IIIw–3

This capability unit consists of deep, somewhat poorly drained to very poorly drained, nearly level soils on flood plains. These soils formed in material weathered from basic calcareous rock or acid rock. They are subject to frequent flooding, which causes scouring. The water table is high much of the year. The capacity for storing moisture and plant nutrients is moderate to high. These soils range from very strongly acid to neutral. They are moderate to moderately high in natural fertility. The soils are—

Bowmansville silt loam.
Melvin and Lindside silt loams (Melvin soil only).
Wehadkee silt loam.

The soils in this capability unit are suited only to a cropping system of low intensity. One such system is a year of a row crop, a year of a small grain, and 2 years of hay. Suitable crops are corn, red clover, ladino clover, and timothy. Artificial drainage generally increases yields. Drainage can be improved by bedding, surface ditches, and random tile lines. Adding manure and growing cover crops help to reduce scouring, to slow leaching, and to maintain organic-matter content and soil structure. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IVe–1

This capability unit consists of moderately deep and deep, well-drained, moderately sloping to strongly sloping soils that are severely eroded or are susceptible to severe erosion. These soil range from very strongly acid to slightly acid. The available moisture capacity ranges from high to low. The soils are—

Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded.
Arendtsville gravelly loam, 15 to 25 percent slopes.
Conestoga silt loam, 8 to 15 percent slopes, severely eroded.
Edgemont channery loam, 15 to 25 percent slopes, moderately eroded.
Highfield channery silt loam, 8 to 15 percent slopes, severely eroded.
Highfield channery silt loam, 15 to 25 percent slopes.
Myersville silt loam, 8 to 15 percent slopes, severely eroded.
Myersville silt loam, 15 to 25 percent slopes.

All of these soils except the Edgemont have a moderate to high capacity for holding available moisture and plant nutrients. The Edgemont soils are more acid than the other soils and are moderate to low in natural fertility. The other soils are moderate to high in natural fertility.

Crops can be grown on the soils in this unit only in a cropping system of very low intensity. One such system is a year of a row crop, a year of a small grain, and 3 or more years of hay or pasture. A cover crop should be seeded after the row crop is harvested. On slopes of more than 20 percent, only hay or pasture should be grown. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass.

Adding manure and returning large amounts of crop residue to these soils help to control erosion, to conserve moisture, and to maintain soil structure and organic-matter content. Fertilizer and lime should be added in amounts indicated by soil tests. Contour stripcropping, diversion terraces, and waterways are needed to control excess runoff and reduce soil washing. Areas in tree fruits should be kept in permanent sod, and areas in bush fruits should be mulched or seeded to a winter cover crop.

CAPABILITY UNIT IVe–2

This capability unit consists of shallow and moderately deep, well-drained, moderately sloping to strongly sloping soils that are moderately eroded or severely eroded and are highly susceptible to further erosion. These soils developed in material weathered from acid rock. They range from slightly acid to very strongly acid. They are permeable and have a moderately low or low capacity for storing moisture and plant nutrients. Natural fertility is moderately low or low. The soils are—

Brecknock silt loam, 8 to 15 percent slopes, severely eroded.
Brecknock silt loam, 15 to 25 percent slopes, moderately eroded.
Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded.
Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded.
Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded.
Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded.
Lansdale loam, 8 to 15 percent slopes, severely eroded.
Manor loam, 8 to 15 percent slopes, severely eroded.
Penn silt loam, 8 to 15 percent slopes, severely eroded.
Penn silt loam, 15 to 25 percent slopes, moderately eroded.
Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded.
Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded.

The Steinsburg and Lansdale soils and the severely eroded Klinesville soil generally have a lower capacity for storing moisture than do the other soils in this unit. Stones in the Catoctin and Brecknock soils interfere with cultivation in some places.

Crops can be grown on the soils in this capability unit only in a cropping system of very low intensity. One such system is a year of a row crop, a year of a small grain, and 3 or more years of hay or pasture. Suitable crops are drought-resistant varieties of corn, small grain, birdsfoot trefoil, and orchardgrass. The Brecknock, Catoctin, Klinesville, and Steinsburg soils produce low yields of corn. Fertilizer and lime should be added in amounts indicated by soil tests. All seeding should be done in contour strips. Diversion terraces and grassed waterways may be needed on long slopes.

CAPABILITY UNIT IVe–3

This capability unit consists of shallow to moderately deep, well-drained, moderately sloping soils that are se-

verely eroded and susceptible to further erosion. These soils developed in material weathered from diabase and calcareous schist. They are medium acid or slightly acid. Some areas have lost all of their original surface layer. These soils are low in available moisture capacity and are droughty. Natural fertility is moderate. The soils are—

Hollinger silt loam, 8 to 15 percent slopes, severely eroded.
Legore channery silt loam, 8 to 15 percent slopes, severely eroded.

Rock ledges in the Legore soil may interfere with cultivation, but crops can be grown on all the soils in this unit if a cropping system of very low intensity is used. One such system is a cultivated crop, a small grain, and 3 or more years of hay. Suitable crops are corn, small grain, alfalfa, birdsfoot trefoil, red clover, and orchardgrass. All seeding should be done in contour strips. Diversion terraces and waterways may be needed on long slopes. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT IVe-4

This capability unit consists of shallow and moderately deep, moderately well drained and somewhat poorly drained soils. These soils are severely eroded and in some areas have lost all of their original surface soil. They formed in material weathered from acid, red shale and metamorphosed shale and sandstone. They are low in available moisture capacity, but they remain wet until late in spring and are excessively wet for long periods. Natural fertility is low. The soils are—

Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded.
Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded.
Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded.

The Lehigh soil ranges from slightly acid to strongly acid, and the Reaville soils are medium acid or strongly acid. Some areas of the Lehigh soil are channery.

Crops can be grown on these soils only in a cropping system of very low intensity, such as a row crop, a small grain, and long-term hay. The Reaville soils are poorly suited to corn. Suitable hay and pasture plants are birdsfoot trefoil and bluegrass. The upright varieties of birdsfoot trefoil are the best suited plants for hay, and the low-growing varieties are the best pasture plants. Fertilizer and lime should be applied in amounts indicated by soil tests. Farming should be done in graded strips, and where practical, seeded waterways, surface drains, diversion terraces, and random tile should be used. Most areas, however, are too shallow for tile drainage.

CAPABILITY UNIT IVw-1

The soils in this capability unit are deep and moderately deep, poorly drained and very poorly drained, and nearly level. They formed in material weathered from shale and sandstone or from calcareous material. They range from very strongly acid to neutral. The risk of erosion is slight. These soils have a high water table much of the year and moderate to high available moisture capacity. They are—

Croton silt loam, 0 to 3 percent slopes.
Dunning silty clay loam.
Guthrie silt loam.
Lamington silt loam.

All of these soils except the Lamington have a slowly permeable subsoil; the Lamington soil has a moderately permeable subsoil. Natural fertility is moderately low in the Croton and Lamington soils and moderately high in the Dunning and Guthrie soils. Dunning soils are subject to flooding.

Crops can be grown on the soils in this unit only in a cropping system of very low intensity. One such system consists of a row crop, winter grain, and 3 or more years of hay or pasture. If these soils are used for pasture, some drainage practices are needed. Suitable crops are corn, small grain, red clover, ladino clover, and timothy. Artificial drainage is needed if satisfactory yields are to be obtained. Fertilizer and lime should be added in amounts indicated by soil tests. Adding manure and mixing crop residue into the soil help to maintain organic-matter content and soil structure. Drainage can be improved by bedding, open ditches, and diversion terraces at the base of slopes. Random tile can be used where it is practical, but in most places the fine-textured, slowly permeable or moderately permeable subsoil prohibits the use of tile.

CAPABILITY UNIT IVw-2

Croton silt loam, 3 to 8 percent slopes, moderately eroded, is the only soil in this capability unit. This soil is deep, poorly drained, and gently sloping or moderately sloping. It formed in material weathered from shale and sandstone. Generally, it is strongly acid. This soil has a slowly permeable subsoil, a high water table for much of the year, and a moderate capacity for storing moisture and plant nutrients. Natural fertility is moderate to low.

Crops can be grown in a cropping system of low intensity that consists of a row crop, winter grain, and 2 years of hay. Suitable crops are corn, small grain, red clover, ladino clover, and timothy. Drainage is needed if satisfactory yields are to be obtained. Some areas can be drained by surface ditches, but the fine-textured subsoil prohibits the use of tile drains in most places. A few places are suitable for random tile. Adding manure and returning crop residue to this soil help to maintain organic-matter content and soil structure. Graded strips, diversion terraces, and waterways are needed to remove excess water and control erosion. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT Vw-1

The soils in this capability unit are deep, poorly drained, and nearly level. They developed in material weathered from diabase or schist and range from strongly acid to neutral. The risk of erosion is slight. These soils have a very slowly permeable subsoil and remain wet for most of the year. They have a moderate to high capacity for storing moisture and plant nutrients. Natural fertility is moderate to high. The soils are—

Watchung silt loam, 0 to 3 percent slopes.
Worsham silt loam, 0 to 3 percent slopes.

All of the soils in this unit are difficult to drain, and in some places stones in the Watchung soil also become a management problem.

These soils can be used for pasture and if drained are suited to birdsfoot trefoil, ladino clover, and bluegrass. Fertilizer and lime should be applied in amounts indicated by soil tests. Bedding and open ditches help to dispose of most of the surface water and some of the subsurface water.

CAPABILITY UNIT VIe-1

This capability unit consists of shallow to deep, well-drained, moderately steep soils that are severely eroded and are highly susceptible to further erosion. Most areas have lost all of the original surface layer. These soils formed in material weathered from diabase or calcareous schist. They range from medium acid to neutral. They are permeable and droughty. Natural fertility is moderate to high. The soils are—

Conestoga silt loam, 15 to 25 percent slopes, severely eroded.
Hollinger silt loam, 15 to 25 percent slopes, severely eroded.
Legore channery silt loam, 15 to 25 percent slopes, severely eroded.

In some places the Legore soil is stony.

The soils in this unit are suitable for pasture. Suitable plants are birdsfoot trefoil, orchardgrass, and bluegrass. Fertilizer and lime should be applied in amounts indicated by soil tests. Reseeding should be done in contour strips. Diversion terraces and drainage outlets may be needed in some places.

CAPABILITY UNIT VIe-2

This capability unit consists of shallow, well-drained, moderately sloping to steep soils that are severely eroded and in most areas have lost all of their original surface soil. These soils developed from material weathered from acid rock, and they range from very strongly acid to slightly acid. They are low in available moisture capacity and are droughty. Permeability is generally rapid or moderately rapid. The organic-matter content is generally low. The soils are—

Brecknock silt loam, 15 to 25 percent slopes, severely eroded.
Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded.
Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded.
Manor loam, 15 to 25 percent slopes, severely eroded.
Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded.

Permeability is rapid or moderately rapid in all of these soils except the Brecknock soil and is moderate in the Brecknock. Natural fertility is moderate in the Catoctin and Manor soils and low in the Brecknock, Steinsburg, and Klinesville soils. In some places the channery Catoctin soil has stones on the surface that cause some problems of management.

The soils in this unit are suitable for pasture. Suitable plants are drought-resistant varieties of birdsfoot trefoil and orchardgrass. Fertilizer and lime should be added in amounts indicated by soil tests. Reseeding should be done in contour strips to help control erosion and conserve moisture until the pasture is established.

CAPABILITY UNIT VIe-3

The soils in this capability unit are moderately deep and deep, well drained, and moderately steep to steep. They formed in material weathered from fanglomerate or basalt. They range from medium acid to extremely acid. Most areas are severely eroded. Erosion has reduced the natural fertility of these soils and their capacity for storing moisture and plant nutrients. The soils are—

Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded.
Arendtsville gravelly loam, 25 to 35 percent slopes.
Highfield channery silt loam, 15 to 25 percent slopes, severely eroded.
Myersville silt loam, 15 to 25 percent slopes, severely eroded.

These soils are suitable for pasture and orchards. If management is good, they produce favorable yields of tree fruits and of birdsfoot trefoil, orchardgrass, and bluegrass. Fertilizer and lime should be applied in amounts indicated by soil tests. Orchards should be kept in permanent sod or cover crops. Pastures should be reseeded in contour strips. Diversion terraces and waterways help in the control of erosion and the management of water.

CAPABILITY UNIT VIe-4

Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded, is the only soil in this capability unit. This soil is shallow, somewhat poorly drained, moderately sloping, and highly susceptible to further erosion. It formed in material weathered from porcelanite. It has a shallow, compact, slowly permeable subsoil and low available moisture capacity. This soil is droughty in summer but is excessively wet during periods of heavy rainfall. It ranges from strongly acid to neutral and has low natural fertility.

When this soil is wet, it should not be worked and the herbage should not be grazed. It can be used for pasture and is suited to drought-resistant varieties of birdsfoot trefoil and orchardgrass. Fertilizer and lime should be added in amounts indicated by soil tests. Reseeding in contour strips, supplemented with diversion terraces and waterways in some areas, help to control excessive runoff and erosion.

CAPABILITY UNIT VIw-1

This capability unit consists of deep, poorly drained soils that formed in material weathered from diabase or schist. These soils range from strongly acid to neutral. They have a slowly permeable subsoil and moderate to high available moisture capacity. The water table is high for much of the year. Erosion is not a serious problem. Natural fertility is moderate to high. The soils are—

Watchung silt loam, 3 to 8 percent slopes.
Worsham silt loam, 3 to 8 percent slopes.

These soils are suitable for pasture, but the herbage should not be grazed when the soils are wet. In some places the stoniness of the Watchung soil limits its use. If management is good and rainfall is normal, these soils produce satisfactory yields of forage. Birdsfoot trefoil, ladino clover, and bluegrass are suitable pasture plants. Diversion terraces and waterways help to dispose of surplus surface water, and spots that remain wet can be drained with random tile. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT VIs-1

This capability unit consists of deep and moderately deep, well-drained soils that are very stony and nearly level to moderately steep. These soils range from extremely acid to slightly acid. They have been damaged very little by erosion. The soils are—

Edgemont very stony loam, 0 to 8 percent slopes.
Edgemont very stony loam, 8 to 25 percent slopes.
Highfield and Catoctin very stony loams, 0 to 8 percent slopes.
Highfield and Catoctin very stony loams, 8 to 25 percent slopes.
Montalto very stony silt loam, 0 to 8 percent slopes.
Montalto very stony silt loam, 8 to 25 percent slopes.

Natural fertility and available moisture capacity are moderately low in the Edgemont soils and moderately high in the Highfield, Catoctin, and Montalto soils.

The soils of this unit are mostly in trees and are well suited to that use. Stoniness makes cultivation impractical. Pasture is the best use for cleared areas, and birdsfoot trefoil, orchardgrass, and bluegrass are suitable for seeding. In cleared areas enough of the stones should be removed from the surface to permit the preparation of a seedbed and the management of the pasture. Reseeding should be done in contour strips to help control erosion and conserve moisture until the sod is well established. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT VIs–2

This capability unit consists of moderately deep and deep, moderately well drained and somewhat poorly drained soils that are level to moderately sloping and very stony. These soils formed in material weathered from porcelanite or from acid colluvial material. Acidity ranges from very strong to slight. The surface layer is permeable and the subsoil is moderately permeable. Available moisture capacity is moderate to moderately high. These soils are not more than slightly eroded, but erosion could become a serious problem on the steeper slopes if the protective cover is removed. The soils are—

Buchanan very stony silt loam, 0 to 12 percent slopes.
Lehigh very stony silt loam, 0 to 10 percent slopes.

Most of the acreage is wooded. Stones limit the suitability of these soils for other uses, though some areas can be used for limited grazing. Birdsfoot trefoil and bluegrass can be grown in cleared areas. Enough stones should be removed from the surface to permit the preparation of the seedbed and the management of the pasture. Slopes should be seeded in graded strips to help control erosion and to dispose of surplus water. Fertilizer and lime should be applied in amounts indicated by soil tests.

CAPABILITY UNIT VIIe–1

This capability unit consists of shallow to deep, strongly sloping to steep, well-drained soils that formed in weathered material that was mostly acid. These soils are moderate to low in natural fertility and are very strongly acid to slightly acid. They are moderately low to very low in available moisture capacity, and they are droughty in dry periods. Erosion is a serious hazard. The soils are—

Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded.
Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded.
Brecknock silt loam, 25 to 50 percent slopes.
Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded.
Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded.
Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded.
Legore channery silt loam, 25 to 35 percent slopes, severely eroded.
Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded.

These soils can be used as woodland, for wildlife, and for recreational uses. Because they are steep and most of them are severely eroded, their use for pasture is limited.

CAPABILITY UNIT VIIs–1

This capability unit consists of deep and moderately deep, well-drained soils that are very stony and steep or very steep. These soils are permeable and are moderately low to moderately high in available moisture capacity. They range from extremely acid to slightly acid. Natural fertility is moderately high to low. The soils are—

Edgemont very stony loam, 25 to 70 percent slopes.
Highfield and Catoctin very stony loams, 25 to 70 percent slopes.
Montalto very stony silt loam, 25 to 50 percent slopes.

These soils are mostly wooded. They should be kept in trees because they are too steep and too stony for cultivated crops and their use for pasture is severely limited. They can be used as wildlife habitat and recreational areas.

CAPABILITY UNIT VIIs–2

This capability unit consists of poorly drained, very stony, nearly level and gently sloping soils. The soils are—

Rohrersville very stony silt loam, 0 to 8 percent slopes.
Watchung very stony silt loam, 0 to 8 percent slopes.

These soils are too stony and too wet for crops. Their use for pasture is severely limited. Most of the acreage is wooded and should remain so. Wildlife habitat and recreational areas are suitable uses.

Management of Orchards [1]

This subsection discusses selecting soils for orchards, the soil associations in the county used for orchards, and managing orchards for apples, peaches, cherries, and other kinds of fruit.

Adams County leads the State in the production of fruit. It ranks first among the counties of the State in the commercial production of apples, second in the production of peaches, and third in the production of cherries. Apricots, plums, and pears are also grown in the county. Orchards occupy about 18,000 acres and are mostly in a belt, 4 to 6 miles wide, along the northern and western boundaries of the county, but some are in the eastern part in the higher areas adjacent to Pigeon Hills (fig. 6). In the orchard belt the soils are generally deep, well drained, and permeable; air drainage is good because the topography is undulating or rolling. The climate of this county is favorable for orchards. The growing season is fairly long, and there is enough rainfall to supply the moisture that fruit trees and bushes need.

Selecting soils for fruit orchards

A fruit grower is exacting when he selects a site for an orchard. He prefers a deep, fertile, medium-textured soil that is on gentle and moderate slopes and is well drained. The site should be higher than the surrounding area so that air drainage is adequate. For some fruits the aspect of the slope is important. Generally, a deep, well-drained soil on the warmer slopes produces fruit that has a good color. The color of apples is improved if there is a wide range of temperature during the ripening stage.

When the fruit grower plants an orchard, he expects the trees to live from 15 to 40 years. The normal life span is 15 to 25 years for peach and sour cherry trees and 30 to 40

[1] By Richard S. Long, soil scientist, Soil Conservation Service.

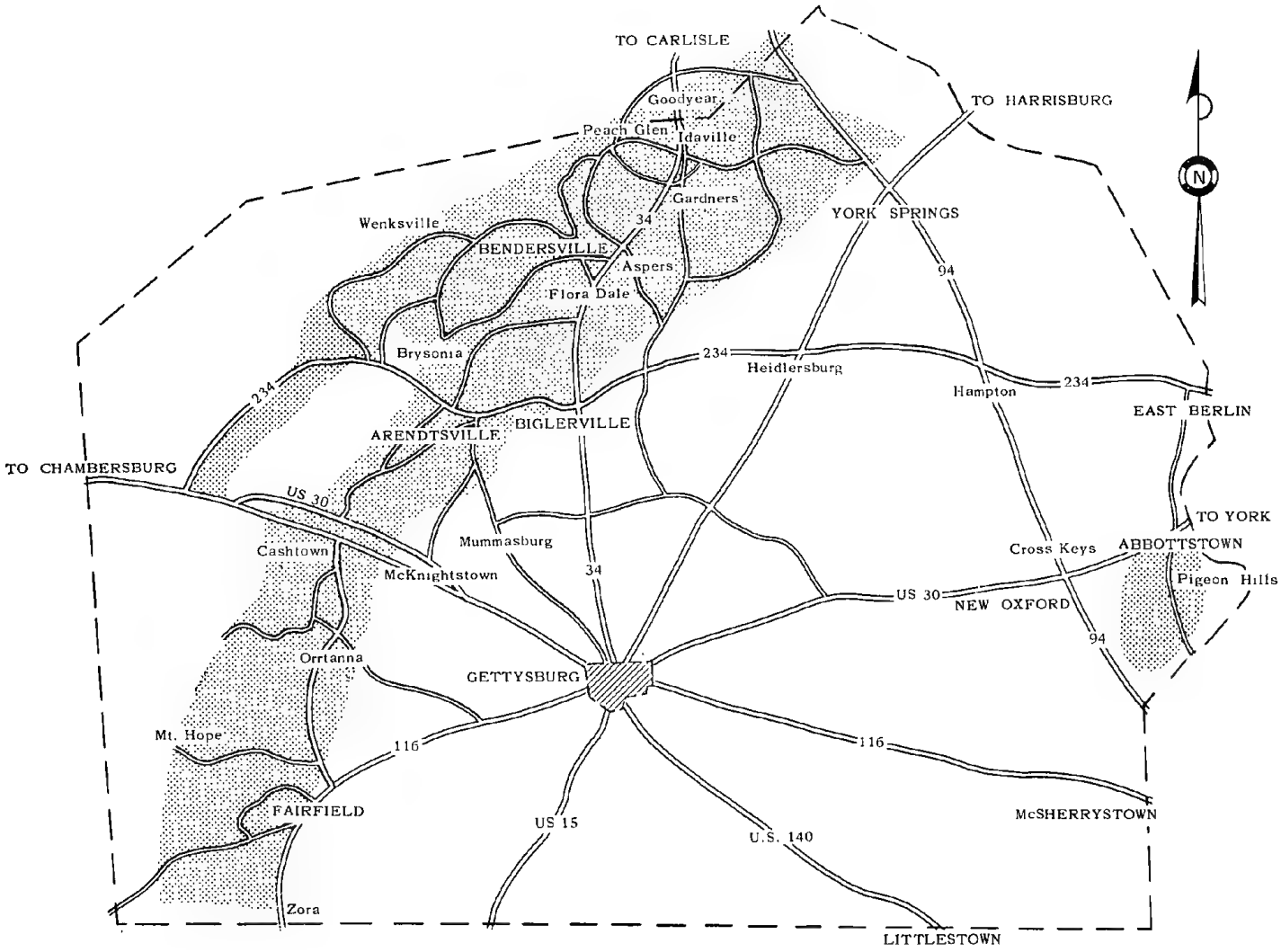

Figure 6.—**Areas in fruit orchards.**

years for apple and pear trees. Some peach trees in the county are still bearing at 25 years of age.

Shallow, droughty soils that have low available moisture capacity should be avoided because fruit trees generally grow slowly on these soils and produce low yields. Many farmers have planted fruit trees on somewhat poorly drained and poorly drained soils, but they use varieties tolerant of wetness. The trees may grow well, but yields are satisfactory only in years when the weather is especially favorable. In these years bumper crops are harvested elsewhere. If ponded water remains around tree roots for 24 to 48 hours at a time, the trees wilt and do not grow well. The kind and variety of fruit planted varies with the tolerance of the tree for wetness. Sweet cherry, peach, and apricot trees are the least tolerant of a wet soil.

Soil associations in the county used for orchards

In Adams County three soil associations are important areas for orchards. In order of their importance, these associations are the Arendtsville-Highfield, the Highfield-Myersville-Catoctin, and the Montalto-Mount Lucas-Watchung.

The Arendtsville-Highfield association contains the best soils for orchards in the county, and orchards are dominant in the association. The Arendtsville soils have the largest acreage. They are deep, well-drained, medium-textured, gravelly soils that are 4 to 20 feet deep over bedrock. Arendtsville soils have excellent air drainage, a deep rooting zone, and high available moisture capacity. They developed in material weathered from loosely cemented, coarse conglomerate consisting of gravel and cobbles, chiefly of quartz, aporhyolite, or metarhyolite, and greenstone, in a red sandy matrix. These soils occur on rolling hills between the Gettsyburg Plain and South Mountain. The Highfield soils are also well suited to fruit orchards.

The small areas of the moderately well drained Buchanan soils and poorly drained Rohrersville soils that occur in this association are frequently subject to frost. Consequently, the planting of fruit trees is hazardous on these soils, even if the soils are artificially drained.

The Highfield-Myersville-Catoctin association is in two areas. The larger area is on South Mountain in the western part of the county, and the smaller area is in the Pigeon Hills along the eastern boundary. Most areas on South

Mountain that have good air drainage have been cleared and planted to fruit trees.

The deep, well-drained Highfield soils are dominant in this association. They developed in material weathered from aporyholite or metarhyolite, rhyolite, metabasalt, and sericitic schist. Scattered throughout areas of these soils are the shallow Catoctin soils. The Catoctin soils produce only fair yields of fruit, because they are moderately low or low in available moisture capacity. However, apples and peaches grown on the Catoctin soils keep well and have excellent color and flavor. The deep, well-drained Myersville soils developed from metabasalt and are redder and finer textured than the Highfield and Catoctin soils. Also, they have higher capacity for storing moisture and plant nutrients. Fruit grown on the Myersville and Highfield soils have slightly better color and flavor than fruit grown on other soils in this association.

Although several large orchards have been established in the Montalto-Mount Lucas-Watchung association, it is of minor importance as an orchard area. Most of the orchards are on the Montalto soils that occur on ridges rising 100 to 150 feet above surrounding areas. The deep, well-drained Montalto soils have a silt loam surface layer and a silty clay to clay subsoil. The moderately well drained Mount Lucas soils and the poorly drained Watchung soils are difficult to manage and generally are not used for orchards, but fruit trees have been planted in some areas that have been drained and have had extra nitrogen fertilizer applied. These areas produce fair yields of fruit.

Managing fruit orchards

Fruit orchards require management that varies according to the kind of fruit, the kind of soil, fertility, and the danger of frost damage and disease.

APPLES

Apple trees grow best on soils that are at least 4 feet deep, have high available moisture capacity, and have had their fertility improved. Soils of this kind are Arendtsville gravelly loam, 0 to 3 percent slopes, Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded, and Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded. On these soils the trees develop an extensive root system by the time they reach bearing age. The trees can take up moisture throughout the growing season and are not damaged during dry periods. Although deep well-drained, moist soils usually produce the highest yields of apples, the flavor, color, and keeping quality are not always the best. A wide range of temperature during the ripening period helps to improve the color of the apples.

Dwarf apple trees or trees on size-controlling rootstock should not be planted in wet or low areas, because they are damaged by frost. In these areas standard varieties of apples are also susceptible to frost damage when the trees are young. As the trees grow larger, however, the fruiting parts are high enough above the ground to escape excessive frost damage. But apples may be planted in small, wet areas so that there are no openings in the orchards; yields in these areas are low. The control of some diseases in apple orchards is more difficult on wet soils than on dry ones. In low areas and in wet areas, some sprays are less effective than in higher and drier areas and susceptibility to rust spots, scab, and wooly aphids on roots is greater. Also, wetness impairs the color, firmness, and flavor of the fruit.

The growth of leaves is increased by applying nitrogen early in spring before the periods of bloom and growth. Most of the growth of apple trees takes place early. In the first 8 to 10 weeks of the growing season, buds appear and the fruit begins to develop. Early, healthy leaves enable the trees to build up carbohydrates, which help support well-developed fruit and strong limbs. A low content of nitrogen is desirable late in summer and early in fall when the fruit is maturing and the wood of the trees is hardening so that it can resist the cold of winter. Although a rich, moist soil produces a heavy protective sod, it also has a greater population of mice. Disking early in fall helps to control the mice, but it also increases decomposition of the organic matter. This decomposition suddenly releases plant nutrients that prolong growth and increase the hazard of damage in winter because the wood has not hardened.

Because the soils generally used for apples are not naturally fertile, added fertilizer is needed after apple trees have been grown in an orchard for 30 to 40 years. A soil test is needed to determine the plant nutrients that should be added before new trees are planted in the old orchard. The soils of some orchards in the county are low in phosphorus, calcium, and magnesium. Adding dolomitic limestone has reduced the drop in yields that has been a result of continued use. On soils low in phosphorus, adding bone meal at planting time has produced excellent results. Bone meal is an excellent source of phosphorous and nitrogen and has no harmful effects if it is placed next to roots at planting time.

PEACHES

Because peach trees bloom early and are likely to be damaged by frost, orchard sites that have good air drainage should be selected. Peach trees can be grown on shallower soils than can apple trees. The Myersville and Highfield soils produce satisfactory yields of peaches that have excellent flavor and keep well.

Because peach trees have shallow roots with which a cover crop competes, the cover crop should be disked under before it starts to take away moisture and plant nutrients that the peach trees need (fig. 7). If the cover crop is disked just before the trees bloom, soil temperature is raised and the danger of frost is reduced. If rainfall is adequate, trashy cultivation can be used. All plant cultivation should be eliminated during the month before harvest because the fruit fills out at this time and needs all the moisture it can get. Peach orchards can be maintained in sod if adequate amounts of fertilizer are applied at the correct time. Technical assistance is needed to determine the time for applying this fertilizer.

If peach trees are to produce regularly each year, the growth of their limbs must be strong in the latter part of the growing season because the peaches are produced from the woody growth of the preceding year. This growth is maintained by good management of soil and water, by applying fertilizer, and by pruning heavily.

CHERRIES, PEARS, APRICOTS, AND PLUMS

Cherry trees require a deep, well-drained, fertile soil on which air drainage is excellent. The Arendtsville, Highfield, and Myersville soils are of this kind. If cherries are to be grown economically, yields each year must be high.

Figure 7.—A peach orchard on Highfield soils. Trees are planted on the contour, and a cover crop of rye and vetch has been disked under.

Both sweet cherries and sour cherries bloom earlier than apples or peaches and should be planted in areas that have better air drainage. Sweet cherries bloom earlier than sour cherries and should be planted in areas where air drainage is best.

The production of pears has been declining recently in Pennsylvania. In Adams County the sites least desirable for orchards are used for pears—areas that are usually too wet for the best growth of other fruits. Unfortunately, conditions that favor a vigorous growth of pears also favor blight and other diseases. Because blight is likely, fertilization is kept to a minimum.

Apricots require deep, well-drained, fertile soils that have good air drainage. Because apricot is the earliest blooming fruit tree, soils should be selected that are not subject to late frost. About the same management is required for apricots as for apples. In Adams County apricots occupy a small acreage and are sold mostly as fresh fruit that is not processed.

The acreage in plums is small in Adams County. The orchards generally have only 50 to 100 trees. Plum orchards are managed in about the same way as peach orchards. The crop is sold locally, mostly at roadside markets.

Productivity Ratings

Table 1 shows, by relative numbers, estimated productivity ratings of the soils in Adams County for specified crops. It also gives, in words, suitability ratings for fruit orchards.

Each rating of relative productivity denotes comparative yields of the soil for a particular crop in relation to a standard index of 100. The standard index represents the average acre yield obtained on the most productive soils of the county under ordinary management. The acre yield represented by the standard index is given at the head of the column for each crop.

The productivity ratings are given for two levels of management. In columns A are ratings to be expected under the management commonly used in Adams County. The ratings in columns B indicate yields that could be obtained if the best management known were practiced to increase production. This management consists of applying fertilizer and lime in amounts indicated by soil tests, of applying extra nitrogen on soils that lack adequate drainage, and of applying all practices needed to control erosion, to conserve moisture, to increase the organic-matter content, to improve tilth, and to improve drainage where necessary. The practices also include choosing improved varieties of crops and forage plants, planting seed at suitable rates and at the appropriate time, and controlling weeds, insects, and diseases.

The ratings of relative productivity were estimated on the basis of the yields during the 5-year period from 1955 to 1960. The estimates were made after considering observations of representatives of the Soil Conservation Service and the Extension Service and studying yield data obtained from farmers in the county.

For any soil in table 1, the actual estimated yields of a specified crop per acre can be determined by multiplying the rating of relative productivity for the soil by the yield represented by 100 at the head of the crop column, and by dividing the product by 100. For example, Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded, under ordinary management, has a productivity rating of 80 for corn. By multiplying 80 by 70 (head of column for corn) and dividing by 100, we get 56. The annual acre yield of corn on Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded, under ordinary management, is 56 bushels per acre.

In table 1, the suitability of a soil for apple orchards was rated according to yields, in bushels per tree, as follows: very good, more than 20; good, 12 to 20; fair, 7 to 12; and poor, less than 7. These yields are for an apple orchard that has trees 15 to 30 years old that are planted 40 to 45 per acre.

The suitability of a soil for peach orchards was rated according to yields, in bushels per tree, as follows: very good, more than 6; good, 4 to 6; fair, 2 to 4; and poor, less than 2. These yields are for a peach orchard that has trees 7 to 18 years old that are planted 80 per acre.

The suitability of a soil for cherry orchards was rated according to yields in pounds per tree, as follows: very good, more than 150; good, 100 to 150; fair, 75 to 100; and poor, less than 75. These yields are for a cherry orchard that has trees 10 years old that are planted 90 per acre.

Woodland Management [2]

Adams County originally had a dense cover of trees, but clearing the land for farming and cutting timber for commercial purposes have eliminated the virgin stands. At present, 64 percent of the county is commercial woodland, all of it second and third growth. The principal forest

[2] By V. C. Miles, woodland specialist, Soil Conservation Service.

types that make up the present woodland and the percentage of the total woodland that each occupies are as follows:

	Percentage of total woodland in the county
Red Oak	66
Northern red oak predominates; associates are black oak, scarlet oak, chestnut oak, and tulip-poplar.	
Chestnut oak	26
Chestnut oak is in pure stands or predominates; common associates are scarlet oak, white oak, black oak, pitch pine, blackgum, and red maple; occasional associates are white pine, red oak, and Virginia pine.	
White oak	4
White oak is in pure stands or predominates; associates are black oak, northern red oak, shagbark hickory, bitternut hickory, white ash, and tulip-poplar.	
Oak-hard pine	4
Pitch pine, Virginia pine, chestnut oak, and scarlet oak predominate; minor associates are table mountain pine, black oak, and blackgum.	

Commercial forest is made up of approximately 11 percent sawtimber, 52 percent poletimber, and 37 percent seedlings and saplings. Trees grow well in this county except in areas where soils are shallow or are deep and very poorly drained. At present, there are in the county many stands of chestnut oak, scarlet oak, Virginia pine, and red maple on soils that would support red oak, tulip-poplar, ash, and white pine. Good woodland management can increase the more desirable trees, for the soils and the climate of the county favor forestry, and technical assistance can be obtained from local foresters. Of the existing woodland in the county, 52 percent is excellent for trees, 35 percent is good, 10 percent is fair, and 3 percent is poor.

Woodland suitability groups

To help in planning the management of woodland, the soils of the county have been placed in woodland groups. Each group consists of soils that have about the same suitability for trees, require about the same management, and have about the same potential productivity. To meet these requirements, the soils in a group are about the same in depth, drainage, and available moisture capacity.

Listed in table 2 are the 18 woodland suitability groups into which the soils of the county have been assigned. The soils in each group are designated by their symbols. For each group, there is a rating of potential productivity, suitable species to favor in management or to plant, and a rating of *slight*, *moderate*, or *severe* for the hazards that hinder the growth of trees. The terms used in table 2 require explanation.

Potential Productivity: In table 2, potential productivity is rated *excellent*, *good*, *fair*, or *poor* on the basis of the site index of the soils for oak, excluding pin oak. The site index for a given soil is the height, in feet, that a specified kind of tree growing on that soil will reach at 50 years of age. Soils are rated *excellent* for production of timber if the site index for oak is 75 or more and the expected yield is 13,750 board feet (international rule) per acre when a stand is 50 years old. A rating of *good* indicates the soils in a group have a site index of 65 to 74 for oak, and an expected yield of 9,750 board feet per acre when a stand is 50 years old. Soils are rated *fair* for production of timber if their site index for oak is 55 to 64 and the expected yield is 6,300 board feet when a stand is 50 years old. A rating of *poor* indicates that the site index for oak is 54 or less and the expected yield is less than 3,250 board feet per acre when a stand is 50 years old.

To determine site index, studies were made of the growth rate on 37 plots representing six extensive soils of Adams County.[3] In these studies the site index is the average height of the tallest trees, in feet, at the age of 50 years. Soils in the county having characteristics similar to those of the soils studied were assumed to have approximately the same site indexes. The volume of timber that normal stands produce at different ages can be determined by using this index and applicable yield tables. Because the growth of trees can be correlated to kinds of soils, a soil map is a good management tool for helping farmers and others in deciding where woodland management will give the best results.

Suitable Species: Listed under "Suitable species" in table 2 are the kinds of native trees that should be favored in management and the kinds of trees that are suitable for planting.

Seedling Mortality: This term refers to the loss of naturally occurring or planted seedlings as influenced by kinds of soil or topographic conditions when plant competition is assumed not to be a limiting factor. Seedling mortality is *slight* if 0 to 25 percent of the seedlings are expected to die and is *moderate* if this percentage is between 25 and 50. If more than 50 percent of the seedlings are expected to die, seedling mortality is *severe*.

Plant Competition: This term refers to the degree that brush, grass, and undesirable trees are likely to invade. Plant competition is *slight* if unwanted plants do not prevent adequate natural regeneration and early growth or do not interfere with the growth of planted seedlings. It is *moderate* if competing plants delay but do not prevent establishment of a normal fully stocked stand by natural regeneration or from planted seedlings. Competition is *severe* where natural or artificial regeneration is not adequate unless there is intensive site preparation and maintenance, including weeding.

Equipment Limitations: Steep slopes, stones, and excess water limit the use of ordinary equipment in pruning, thinning, harvesting, and other woodland management. The rating is *slight* if there are very few limitations on the type of equipment or the time of year that the equipment can be used. It is *moderate* if slopes are moderately steep, if heavy equipment is restricted by wetness during the wettest periods, or if the equipment moderately damages the roots. Equipment limitations are *severe* if many types of equipment cannot be used, if the time equipment cannot be used is more than 3 months in a year, or if the use of equipment severely damages the roots of trees and the structure and stability of the soils.

Erosion Hazard: Hazard of erosion is rated according to the risk of erosion on well-managed woodland that is not protected by special practices. It is *slight* where only a small loss of soil is expected, even when trees are harvested. The erosion hazard is *moderate* where a moderate loss of soil is expected if runoff is not controlled and vegetative cover is not adequate for protection. Where the erosion hazard is moderate, moderate practices are needed on skid trails and logging roads immediately after

[3] The results of these studies are on file in the State office of the Soil Conservation Service at Harrisburg.

TABLE 1.—*Estimated productivity ratings of soils*

[The ratings in columns A indicate productivity under common management; ratings in columns B indicate productivity under

Symbol	Soil	Corn (100—70 bushels per acre)		Wheat (100—30 bushels per acre)		Oats (100=45 bushels per acre)		Grass-legume hay (100=1.8 tons per acre)	
		A	B	A	B	A	B	A	B
AbA	Abbottstown silt loam, 0 to 3 percent slopes	55	85	65	100	----	75	55	110
AbA2	Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded.	55	80	60	90	50	75	50	100
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded.	50	75	55	85	50	75	55	105
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes	95	170	100	125	100	120	100	155
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded.	85	165	100	125	100	120	95	150
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded.	80	155	95	120	85	110	80	140
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded.	65	135	80	100	85	100	60	115
AgD	Arendtsville gravelly loam, 15 to 25 percent slopes.	70	145	75	105	90	110	90	125
AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded.	----	----	50	75	65	85	50	80
AgE	Arendtsville gravelly loam, 25 to 35 percent slopes.	----	----	----	----	----	----	----	----
AgE3	Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded.	----	----	----	----	----	----	----	----
AgF2	Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded.	----	----	----	----	----	----	----	----
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded.	100	180	100	135	100	120	100	140
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded.	95	170	95	125	95	115	95	140
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded.	85	160	90	115	90	110	90	135
Be	Bermudian silt loam	100	185	95	125	85	110	95	140
BmA	Birdsboro silt loam, 0 to 3 percent slopes	95	170	95	125	85	110	90	135
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded.	85	165	90	115	75	105	80	125
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded.	80	155	85	105	75	95	75	120
Bn	Bowmansville silt loam	----	100	----	65	----	----	45	110
BoA	Bowmansville silt loam, local alluvium, 0 to 3 percent slopes.	----	115	----	85	----	----	50	115
BoB	Bowmansville silt loam, local alluvium, 3 to 8 percent slopes.	----	120	----	95	----	----	65	125
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded.	65	120	85	115	80	115	80	105
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded.	55	100	75	110	75	110	70	95
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded.	45	----	55	95	55	75	50	70
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded.	50	85	65	100	70	100	65	90
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded.	35	----	50	80	50	65	45	65
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded.	45	----	60	90	60	85	60	80
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded.	----	----	----	65	----	60	45	70
BrE	Brecknock silt loam, 25 to 50 percent slopes	----	----	----	----	----	----	----	----
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes	55	100	85	115	60	100	75	105
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes	55	95	75	110	55	90	70	95
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes.	----	----	----	----	----	----	----	----
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded.	55	95	65	110	60	105	55	75
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded.	50	80	60	90	55	80	50	65
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded.	45	----	55	75	45	75	45	55
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded.	----	----	55	85	50	75	45	65

See footnote at end of table.

for specified crops under two levels of management

improved management. The absence of data indicates that the soil is not suited to the specified crop at the specified level of management]

Alfalfa-grass hay (100=2.5 tons per acre)		Bluegrass pasture (100=100 cow-acre-days) [1]		Tall grass pasture (100=100 cow-acre-days) [1]		Suitability for orchards					
						Apple		Peach		Cherry	
A	B	A	B	A	B	A	B	A	B	A	B
		60	80	70	100						
		55	75	65	95						
		50	70	70	100						
100	150	80	95	105	130	Good	Very good	Good	Very good	Good	Very good.
100	150	75	90	100	120	Good	Very good	Good	Very good	Good	Very good.
90	135	70	85	88	108	Good	Very good	Good	Very good	Good	Very good.
70	110	60	77	75	90	Good	Very good	Good	Very good	Good	Very good.
90	130	68	80	80	95	Good	Very good	Fair	Very good	Fair	Very good.
65	100	48	63	70	85	Fair	Good				
		50	65	79	90	Poor	Fair				
		40	55	63	78						
100	160	88	115	125	155	Fair	Good	Fair	Good	Poor	Fair.
95	160	83	110	120	150	Fair	Good	Fair	Good	Fair	Good.
90	150	80	105	115	145	Good	Very good	Fair	Good	Fair	Good.
95	160	90	120	128	160						
90	150	88	118	125	155						
90	145	85	115	118	148	Poor	Fair	Poor	Fair	Poor	Fair.
85	135	83	112	110	140	Fair	Good	Fair	Good	Fair	Good.
			80		115						
			90		120						
			100		125						
100	125	60	85	100	135	Poor	Fair	Poor	Fair	Poor	Fair.
95	120	60	78	90	130	Poor	Fair	Poor	Fair	Poor	Fair.
70	95	50	60	75	105						
80	105	55	72	78	120	Poor	Fair	Poor	Fair	Poor	Fair.
65	80	45	55	60	100						
75	100	50	70	65	108	Poor	Fair	Poor	Fair	Poor	Fair.
60	75	40	50	40	78						
		60	80	100	130	Poor	Fair				
		55	75	95	125	Poor	Fair				
		50	70	80	105						
70	110	43	70	95	130	Poor	Fair	Poor	Fair	Poor	Fair.
65	100	38	60	90	125	Poor	Fair	Poor	Fair	Poor	Fair.
60	85	33	45	75	90	Poor	Fair	Poor	Fair	Poor	Poor.
55	80	30	50	85	120	Poor	Fair	Poor	Fair	Poor	Poor.

TABLE 1.—*Estimated productivity ratings of soils for*

Symbol	Soil	Corn (100=70 bushels per acre)		Wheat (100=30 bushels per acre)		Oats (100=45 bushels per acre)		Grass-legume hay (100=1.8 tons per acre)	
		A	B	A	B	A	B	A	B
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded.			45	65	40	55	30	50
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded.								
Ck	Chewacla silt loam	85	170	65	95	55	90	80	120
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded.	100	180	95	130	105	120	100	104
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded.	100	170	95	125	100	120	95	140
CoB3	Conestoga silt loam, 3 to 8 percent slopes; severely eroded.	70	145	85	115	90	110	80	120
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded.	95	165	90	125	95	105	90	125
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded.	65	130	65	95	85	100	70	105
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded.	55	95	60	80	75	90	65	80
CrA	Croton silt loam, 0 to 3 percent slopes				85			55	110
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded.		80	40	85			45	100
Du	Dunning silty clay loam		95		95			50	110
EcB	Edgemont channery loam, 3 to 8 percent slopes	70	135	65	95	65	100	70	115
EcC	Edgemont channery loam, 8 to 15 percent slopes	65	125	60	85	60	95	60	105
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded.	55	115	45	80	45	75	45	90
EhB	Edgemont very stony loam, 0 to 8 percent slopes								
EhD	Edgemont very stony loam, 8 to 25 percent slopes								
EhE	Edgemont very stony loam, 25 to 70 percent slopes.								
GcA	Glenelg silt loam, 0 to 3 percent slopes	95	155	100	135	90	120	105	120
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded.	85	130	85	115	85	115	90	110
GcC	Glenelg silt loam, 8 to 15 percent slopes	90	135	95	110	75	115	95	115
GcC2	Glenelg silt loam, 8 to 15 percent slopes, moderately eroded.	80	120	75	100	65	110	80	105
GnA	Glenville silt loam, 0 to 3 percent slopes	85	165	65	95	55	85	75	120
GnB	Glenville silt loam, 3 to 8 percent slopes	95	155	75	100	60	95	80	125
Gu	Guthrie silt loam		80		75			50	115
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded.	90	165	95	115	90	110	55	120
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded.	85	155	80	105	85	100	70	115
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded.	80	150	75	100	75	95	60	105
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded.	65	130	60	85	55	85	50	100
HcD	Highfield channery silt loam, 15 to 25 percent slopes.	80	145	65	95	75	90	60	95
HcD3	Highfield channery silt loam, 15 to 25 percent slopes, severely eroded.								
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes.								
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes.								
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes.								
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded.	65	120	85	115	80	115	90	115
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded.	35	95	65	100	65	80	65	95
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded.			50	85	55	65	55	80
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	45		65	90	55	70	60	105
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded.	45		60	85	50	65	55	100
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded.	30		50	75			45	65

See footnote at end of table.

specified crops under two levels of management—Continued

Alfalfa-grass hay (100=2.5 tons per acre)		Bluegrass pasture (100=100 cow-acre-days) [1]		Tall grass pasture (100=100 cow-acre-days) [1]		Suitability for orchards					
						Apple		Peach		Cherry	
A	B	A	B	A	B	A	B	A	B	A	B
50	75	25	40	70	80						
		20	35	60	70						
	80	75	125	100	180						
125	165	90	115	115	165	Fair	Good	Poor	Good	Poor	Good.
120	160	83	110	110	160	Fair	Good	Poor	Good	Poor	Good.
110	150	70	95	95	145	Fair	Good	Poor	Good	Poor	Good.
115	155	80	105	105	155	Fair	Good	Poor	Good	Poor	Good.
100	140	65	90	90	140	Fair	Good	Poor	Good	Poor	Good.
90	120	60	85	85	135	Poor	Fair	Poor	Poor	Poor	Poor.
		20	90	40	120						
		35	90	65	118						
		45	100	70	130						
80	140	60	100	105	140	Fair	Good	Fair	Good	Fair	Good.
75	125	55	90	100	135	Fair	Good	Fair	Good	Fair	Good.
70	110	45	70			Fair	Good	Fair	Good	Fair	Good.
		40	80			Fair	Good	Fair	Good	Fair	Good.
		35	60			Fair	Good	Fair	Good	Fair	Good.
						Fair	Good	Fair	Good	Fair	Good.
110	145	55	100	110	160	Fair	Good	Fair	Good	Fair	Good.
105	135	50	85	100	150	Fair	Good	Fair	Good	Fair	Good.
100	135	48	80	98	145	Fair	Good	Fair	Good	Fair	Good.
95	130	45	75	90	140	Fair	Good	Fair	Good	Fair	Good.
	80	75	110	120	150		Poor				
	90	80	110	125	150		Poor				
		30	115	80	145						
80	115	63	105	120	155	Good	Very good	Good	Very good	Good	Very good.
80	120	60	100	110	145	Good	Very good	Good	Very good	Good	Very good.
70	110	58	100	105	140	Good	Very good	Good	Very good	Good	Very good.
65	100	52	90	95	130	Fair	Good	Fair	Good	Fair	Good.
70	110	48	95	105	138	Good	Very good	Good	Very good	Good	Very good.
		37	85	85	120	Fair	Good	Poor	Good	Poor	Good.
		55	95			Fair	Good	Fair	Good	Fair	Good.
		40	80			Fair	Good	Fair	Good	Fair	Good.
		30	60			Poor	Fair				
110	135	70	95	110	140	Poor	Fair	Poor	Fair	Poor	Fair.
90	120	60	85	90	120	Poor	Fair	Poor	Fair	Poor	Fair.
80	110	50	75	80	110	Poor	Fair	Poor	Fair	Poor	Fair.
80	110	24	55	60	85						
50	80	22	52	55	80						
		20	50	50	75						

TABLE 1.—*Estimated productivity ratings of soils for*

Symbol	Soil	Corn (100=70 bushels per acre)		Wheat (100=30 bushels per acre)		Oats (100=45 bushels per acre)		Grass-legume hay (100=1.8 tons per acre)	
		A	B	A	B	A	B	A	B
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded.	45	----	45	65	45	60	50	95
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded.	----	----	35	50	----	----	35	70
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded.	----	----	----	----	----	----	----	55
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded.	----	----	----	----	----	----	----	----
La	Lamington silt loam	----	75	0	85	----	----	50	110
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded.	75	120	85	115	80	115	75	105
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded.	70	115	75	110	75	110	70	100
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded.	65	106	65	95	65	100	55	80
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded.	70	110	65	100	70	105	65	95
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded.	55	100	60	85	55	90	50	75
Le	Lawrence silt loam	35	85	50	85	----	55	55	110
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded.	70	120	75	110	75	110	75	100
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded.	70	115	65	100	75	105	70	95
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded.	60	105	55	85	60	95	60	80
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded.	55	80	50	75	50	80	50	70
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded.	----	----	----	----	----	----	----	----
LhA	Lehigh silt loam, 0 to 3 percent slopes	55	100	85	120	60	100	80	110
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded.	50	95	80	115	55	90	75	100
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded.	45	85	70	100	50	75	65	80
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded.	35	80	65	95	45	70	60	75
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes	----	----	----	----	----	----	55	70
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded.	65	115	85	115	75	105	75	100
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded.	55	100	75	105	70	95	65	90
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded.	45	85	65	95	60	85	55	75
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded.	----	----	55	85	55	70	45	65
Me	Melvin and Lindside silt loams:								
	Melvin soil	----	95	----	75	----	----	50	110
	Lindside soil	100	180	85	115	60	85	100	140
MoA	Montalto silt loam, 0 to 3 percent slopes	90	155	95	125	90	115	90	125
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded.	85	145	85	115	80	105	80	120
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded.	80	130	75	105	70	95	75	115
MsB	Montalto very stony silt loam, 0 to 8 percent slopes.	----	----	----	----	----	----	65	105
MsD	Montalto very stony silt loam, 8 to 25 percent slopes.	----	----	----	----	----	----	55	95
MsE	Montalto very stony silt loam, 25 to 50 percent slopes.	----	----	----	----	----	----	----	----
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded.	65	150	75	100	65	100	75	105
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded.	80	155	75	110	75	100	75	105
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded.	70	150	70	105	60	95	70	100
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes.	35	65	----	95	----	----	55	100

See footnote at end of table.

specified crops under two levels of management—Continued

Alfalfa-grass hay (100=2.5 tons per acre)		Bluegrass pasture (100=100 cow-acre-days) [1]		Tall grass pasture (100=100 cow-acre-days) [1]		Suitability for orchards					
						Apple		Peach		Cherry	
A	B	A	B	A	B	A	B	A	B	A	B
50	75	20	50	53	78						
		16	45	48	70						
				43	65						
				35	55						
		30	90	60	120						
75	95	58	82	92	130	Poor	Fair	Poor	Fair		
70	90	55	80	90	125	Poor	Fair	Poor	Fair		
65	80	50	75	70	100	Poor	Fair	Poor	Fair		
70	85	53	78	90	115	Poor	Fair	Poor	Fair		
60	75	45	70	65	95						
		30	100	80	125						
90	115	60	85	100	135	Poor	Fair	Poor	Fair	Poor	Fair.
85	110	58	82	95	130	Poor	Fair	Poor	Fair	Poor	Fair.
75	100	50	75	85	120	Poor	Fair	Poor	Fair	Poor	Fair.
65	90	45	65	80	115	Poor	Fair				
				70	105						
	85	60	80	100	130	Poor	Fair				
	80	55	75	95	125	Fair	Good				
	70	45	68	85	115	Fair	Good				
	60	40	63	80	108	Fair	Good				
	50	35	57	80	110	Poor	Fair				
90	120	55	70	100	130	Fair	Good	Fair	Good		
85	110	50	65	95	125	Fair	Good	Fair	Good		
75	105	42	57	87	118						
70	95	38	52	80	112						
		30	100	70	130						
90	130	100	140	120	185						
85	125	80	110	125	80	Fair	Good	Fair	Good	Fair	Good.
80	120	75	100	120	150	Fair	Good	Fair	Good	Fair	Good.
70	110	75	95	115	145	Fair	Good	Fair	Good	Fair	Good.
65	105	60	85	80	110	Fair	Good	Fair	Good	Fair	Good.
50	90	50	75	70	100	Fair	Good	Fair	Good	Fair	Good.
75	110	70	95	105	140	Poor	Fair				
70	110	70	90	110	145	Poor	Fair				
70	110	65	85	100	135	Poor	Fair				
		65	80	50	130						

TABLE 1.—*Estimated productivity ratings of soils for*

Symbol	Soil	Corn (100=70 bushels per acre)		Wheat (100=30 bushels per acre)		Oats (100=45 bushels per acre)		Grass-legume hay (100=1.8 tons per acre)	
		A	B	A	B	A	B	A	B
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes.	45	70	65	100	----	----	65	115
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded.	80	150	95	125	90	110	80	120
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded.	85	150	85	125	85	105	75	110
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded.	70	140	80	115	80	105	70	105
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded.	65	130	65	100	70	95	55	80
MvD	Myersville silt loam, 15 to 25 percent slopes	70	135	85	115	75	100	70	100
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded.	55	120	50	75	60	80	50	75
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded.	80	125	80	125	85	110	90	115
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded.	80	120	75	115	75	105	80	110
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded.	50	95	60	105	60	85	70	95
PeC2	Penn silt loam, 8 to 15 percent slopes, moderately eroded.	70	115	65	110	70	95	75	100
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded.	45	85	55	95	55	75	65	90
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded.	50	95	60	105	60	85	65	90
RaA	Readington silt loam, 0 to 3 percent slopes	80	115	80	120	65	95	90	125
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded.	70	105	75	115	65	95	80	115
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes:								
	Readington soil	80	115	80	120	65	95	90	125
	Wiltshire soil	100	180	85	115	60	85	100	140
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded:								
	Readington soil	70	105	75	115	65	95	80	115
	Wiltshire soil	100	175	75	110	75	95	100	140
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	35	----	40	65	----	45	60	105
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded.	35	----	50	75	----	----	55	100
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded.	----	----	40	65	----	----	45	90
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded.	----	----	----	60	----	----	40	80
RhA	Rohrersville silt loam, 0 to 3 percent slopes	----	----	----	80	----	----	45	105
RhB	Rohrersville silt loam, 3 to 8 percent slopes	----	----	----	75	----	----	75	100
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes.	----	----	----	----	----	----	----	----
Ro	Rowland silt loam	80	115	75	110	55	90	80	110
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes moderately eroded.	45	----	55	85	50	65	50	95
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded.	25	----	45	75	45	60	40	80
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded.	40	----	50	80	45	65	45	90
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded.	----	----	----	75	40	55	----	----
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded.	----	----	----	----	----	----	----	----
WaA	Watchung silt loam, 0 to 3 percent slopes	----	----	----	95	----	----	----	100
WaB	Watchung silt loam, 3 to 8 percent slopes	----	----	----	100	----	----	----	105
WcA	Watchung very stony silt loam, 0 to 8 percent slopes.	----	----	----	----	----	----	----	----
Wd	Wehadkee silt loam	----	95	----	85	----	----	40	110
WoA	Worsham silt loam, 0 to 3 percent slopes	----	60	----	100	----	----	----	100
WoB	Worsham silt loam, 3 to 8 percent slopes	----	70	----	110	----	----	----	105

Cow-acre-days is the number of days 1 acre will graze 1 cow, steer, or horse, 6 hogs, or 7 sheep without damage to the pasture.

specified crops under two levels of management—Continued

Alfalfa-grass hay (100=2.5 tons per acre)		Bluegrass pasture (100=100 cow-acre-days) [1]		Tall grass pasture (100=100 cow-acre-days) [1]		Suitability for orchards					
						Apple		Peach		Cherry	
A	B	A	B	A	B	A	B	A	B	A	B
		70	85	60	135						
80	140	65	90	90	130	Good	Very good	Good	Very good	Good	Very good.
75	135	63	85	85	125	Good	Very good	Good	Very good	Good	Very good.
70	130	60	83	83	120	Good	Very good	Good	Very good	Good	Very good.
60	110	55	75	70	110	Fair	Good	Fair	Good	Fair	Good.
70	120	60	81	81	118	Good	Very good	Good	Very good	Good	Very good.
55	95	45	55	65	100	Fair	Good	Fair	Good	Fair	Good.
105	135	65	85	105	140	Poor	Fair	Poor	Fair	Poor	Fair.
100	130	63	80	100	135	Poor	Fair	Poor	Fair	Poor	Fair.
90	115	50	68	90	125						
95	125	60	75	95	128	Poor	Fair	Poor	Fair	Poor	Fair.
85	110	45	63	80	115						
85	120	55	70	90	120						
50	85	70	90	100	130	Poor	Fair				
50	80	68	85	95	125	Poor	Fair				
50	85	70	90	100	130	Poor	Fair				
90	130	100	140	120	185						
50	80	68	85	95	125	Poor	Fair				
90	130	90	120	110	160						
		50	70	60	90						
		45	65	55	85						
		35	55	45	65						
		30	50	40	60						
		20	85	40	110						
		40	90	60	115						
		30	55	70	100						
		70	90	100	130						
50	80	22	52	55	80						
		20	50	50	75						
50	75	20	50	53	78						
50	80	25	60	60	90						
		15	25	50	80						
		25	75	30	130						
		35	85	60	125						
		22	65								
		25	90	40	120						
		25	75	60	120						
		35	85	65	120						

TABLE 2.—*Potential productivity, suitable trees, and hazards of woodland suitability groups*

Woodland suitability group	Potential productivity	Suitable species		Seedling mortality	Plant competition	Equipment limitations	
		Native trees to favor	Planted trees				
Group 1: Deep, well-drained soil that has high available moisture capacity; on flood plains with slopes of as much as 3 percent (Be).	Excellent	Red oak, tulip-poplar, ash, white pine, black walnut.	Larch, white pine, Austrian pine, Norway spruce, tulip-poplar.	Slight	Severe	Slight	S
Group 2: Deep, moderately well drained soils that have high available moisture capacity; on flood plains with slopes of as much as 3 percent (Ck, Ro).	Good	Red oak, tulip-poplar, ash, white pine.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Moderate	S
Group 3: Deep, poorly drained, slowly permeable soils that have high available moisture capacity; on flood plains with slopes of as much as 8 percent (Bn, BoA, BoB, Me, Wd).	Fair	White pine, hemlock, red maple, pin oak.	White pine, white spruce.	Moderate	Severe	Severe	S
Group 4: Deep, very poorly drained soil that has high available moisture capacity; on flood plains with slopes of as much as 3 percent (Du).	Poor	White pine, hemlock, red maple, pin oak.	White pine, white spruce.	Severe	Severe	Severe	S
Group 5: Deep and moderately deep, well-drained soils that have high available moisture capacity; on uplands with slopes of as much as 25 percent (AgA, AgB2, AgC2, AgC3, AgD, AgD3, AtA2, AtB2, AtC2, BmA, BmB2, BmC2, CoA2, CoB2, CoB3, CoC2, CoC3, CoD3, HcA2, HcB2, HcC2, HcC3, HcD, HcD3, LdA2, LdB2, LdB3, LdC2, LdC3, MoA, MoB2, MoC2, MsB, MsD, MvA2, MvB2, MvC2, MvC3, MvD, MvD3).	Excellent	Red oak, tulip-poplar, ash, white pine, black walnut.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Slight or moderate.	S
Group 6: Deep, well-drained soils that have high available moisture capacity; on uplands with slopes of more than 25 percent (AgE, AgE3, AgF2, MsE).	Good	Red oak, tulip-poplar, ash, white pine, black walnut.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Severe	S

Group 7: Deep, moderately well drained and somewhat poorly drained, moderately permeable soils that have high available moisture capacity; on uplands with slopes of as much as 15 percent (Le, MtA2, MtB2, MtC2, RdA, RdB2).	Good	Red oak, tulip-poplar, ash, white pine.	Larch, white pine, Austrian pine, Norway spruce, white spruce.	Slight	Severe	Moderate	Sl
Group 8: Deep and moderately deep, well-drained soils that have moderate available moisture capacity; on uplands with slopes of as much as 25 percent (EcB, EcC, EcD2, EhB, FhD, LgB2, LgC2, MaB2, MaC2).	Good	Red oak, tulip-poplar, ash, white pine.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Slight or moderate.	Sl
Group 9: Deep and moderately deep, well-drained soil that has moderate available moisture capacity; on uplands with slopes of more than 25 percent (EhE).	Good	Red oak, tulip-poplar, ash, white pine.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Severe	Se
Group 10: Deep, moderate well drained soils that have a fragipan or are fine textured and have moderate available moisture capacity; on uplands with slopes of as much as 12 percent (BuA, BuB, BvC, GnA, GnB, RaA, RaB2).	Good	Red oak, tulip-poplar, ash, white pine.	Larch, white pine, Austrian pine, Norway spruce, white spruce.	Slight	Severe	Moderate	Sl
Group 11: Shallow and moderately deep, well-drained soils that have moderate available moisture capacity; on uplands with slopes of as much as 25 percent (BrA2, BrB2, BrC2, BrD2, CcB2, CcC2, CcD2, GcA, GcB2, GcC, GcC2, HhB, HhD, HoB2, PeA2, PeB2, PeC2, PeD2, SsB2, SsC2).	Good	Red oak, black oak, tulip-poplar, white pine.	Larch, white pine, Austrian pine, Norway spruce.	Slight	Severe	Slight or moderate.	S
Group 12: Deep and moderately deep, somewhat poorly drained soils that have a fragipan or are fine textured and have moderate available moisture capacity; on uplands with slopes of as much as 10 percent (AbA, AbA2, AbB2, LhA, LhB2, LvB, MuA, MuB).	Good	Red oak, black oak, tulip-poplar, white pine.	Larch, white pine, white spruce.	Slight	Severe	Moderate	S
Group 13: Deep, poorly drained soils that have a fragipan or are fine textured and have moderate available moisture capacity; on uplands with slopes of as much as 8 percent (CrA, CrB2, Gu, La, RhA, RhB, RmB, WaA, WaB, WcA, WoA, WoB).	Fair	Red oak, black oak, white pine, tulip-poplar.	Larch, white pine, white spruce.	Moderate	Severe	Severe	S

TABLE 2.—*Potential productivity, suitable trees, and hazards of woodland suitability groups*—Contin

Woodland suitability group	Potential productivity	Suitable species		Seedling mortality	Plant competition	Equipment limitations	
		Native trees to favor	Planted trees				
Group 14: Shallow, well-drained soils that have low available moisture capacity; on uplands with slopes of as much as 25 percent (BrB3, BrC3, BrD3, CcC3, CcD3, HoC3, HoD3, KsA2, KsB2, KsC2, LgC3, LgD3, MaC3, MaD3).	Fair	Red oak, black oak, white pine, Virginia pine.	White pine, Virginia pine.	Moderate	Moderate	Slight or moderate.	S
Group 15: Shallow, well-drained soils that have low available moisture capacity; on uplands with slopes of more than 25 percent (HhE).	Poor	Red oak, black oak, white pine, Virginia pine.	White pine, Virginia pine.	Severe	Slight	Severe	S
Group 16: Moderately deep, somewhat poorly drained soils that have a fragipan or are fine textured and have low available moisture capacity; on uplands with slopes of as much as 15 percent (LtB3, LtC3, ReA2, ReB2, ReB3).	Poor	Virginia pine, white pine, red maple, black oak.	White pine, Virginia pine.	Moderate	Moderate	Slight or moderate.	S
Group 17: Very shallow, well-drained soils that have very low available moisture capacity; on uplands with slopes of as much as 25 percent (KsB3, KsC3, KsD3, PeB3, PeC3, ReC3, SsB3, SsC3, SsD3).	Poor	Virginia pine, pitch pine, chestnut oak.	Virginia pine	Severe	Slight	Slight to moderate.	S
Group 18: Very shallow, well-drained soils that have very low available moisture capacity and moderate natural fertility; on uplands with slopes of more than 25 percent (BrE, CcE3, KsE3, LgE3).	Poor	Virginia pine, pitch pine, chestnut oak.	Virginia pine	Severe	Slight	Severe	S

trees are harvested. The erosion hazard is *severe* where steep slopes, rapid runoff, and slow infiltration and permeability make the soil susceptible to severe erosion. In these areas harvesting and other operations should be done across the slope as much as possible. Skid trails and logging roads should be laid out on mild slopes, and excess water should be disposed of carefully during logging. Immediately after logging, practices to control erosion should be used on the logging roads and skid trails.

WINDTHROW HAZARD: This hazard is rated on the basis of characteristics that affect the development of roots and how firmly the roots anchor the trees so that they resist the force of the wind. The windthrow hazard is *slight* if no trees are expected to be blown down by a normal wind. It is *moderate* if roots hold the trees firmly, except when the soil is excessively wet and the velocity of the wind is high. The hazard is *severe* if rooting is not deep enough to give stability. Many trees are expected to be blown down when the soil is very wet or the wind is high. Individual trees are likely to be blown over if they are released on all sides.

Use of Soils for Wildlife[4]

In Adams County, as elsewhere, the kinds and amounts of wildlife greatly depend on the kinds of soils, though this relationship between the soils and wildlife is not always easily distinguished. The soils affect wildlife through their influence on the vegetation that grows and supplies food and cover for the wildlife.

Under natural conditions, the patterns or combinations of vegetation in an area depend on the distribution of the various kinds of soils. An area is inhabited by the kinds of wildlife that have their habitat requirements met by the vegetation in the area. If the natural conditions in the area are altered by drainage, or by the other practices used in managing farmland or woodland, the kinds and patterns of vegetation change. With this change in vegetation, there may also be a change in the kinds and numbers of wildlife.

Kinds of wildlife in the county

White-tailed deer are considered forest species, but they neither prefer nor do well in large mature forests. They prefer a combination consisting of brush or young trees, lesser amounts of mature trees, and small open areas. Deer can be found throughout Adams County where there are woodlots, but they are in greatest numbers in the northern part of the county in the Edgemont-Highfield and Highfield-Myersville-Catoctin soil associations. In the thickly wooded, mountainous parts of these associations, wild turkeys are more numerous than they are in other parts of the county. Ruffed grouse are also numerous in these associations.

Gray squirrels live in woodland, dominantly of oak and hickory. They are found in abundance where cornfields intersperse the woodland. Gray squirrels generally prefer the edges of woodland and openings in the woodland to large unbroken tracts of trees. All of the soil associations in the county have some areas suitable for squirrels.

Bobwhite, or quail, and mourning doves occur most commonly in the Penn-Lansdale-Abbottstown association and in other places in the southern part of the county. In that association fields of corn and of small grain adjoin meadows, bushy areas, and small woodlots. Quail decline in number where large areas of farmland are clean cultivated and where there are extensive grasslands and many orchards.

Pheasants are most abundant in the large areas of fertile farmland in the southern part of the county, especially where corn and small grain are produced. The pheasants are fewer in the Arendtsville-Highfield association and in other places in the northern part of the county where there are orchards and hills. In these places the soils are fertile, but less food suitable for pheasants is produced. Ring-necked pheasants have been related to the soils derived from limestone in the southeastern part of Pennsylvania because these soils are intensively cultivated to corn and small grain. Generally, the capacity to produce wildlife food and cover depends on the fertility of the soils. The larger, healthier birds and animals are generally found on or near the most fertile soils.

Cottontail rabbits live in most of the soil associations in the county and are the most abundant game animals. They are most numerous in brushy areas interspersed with cropland and grassland. Fewer rabbits are found in large cultivated fields and in dense woodlots.

Waterfowl, mainly mallards, black ducks, and wood ducks, come seasonally in fair numbers along the Conewago and Bermudian Creeks, as well as on the many farm ponds and in the marshy areas of the county. The Chambersburg Reservoir is the major waterfowl area of the county. A small number of woodcock inhabits the southern part of the county along Marsh Creek and in adjacent marshy areas.

Mountain Creek and Middle Creek in the northern part of the county provide good trout fishing. The fishing for largemouth bass is excellent in Conewago Creek in the southern part of the county.

Suitability of soils for wildlife

In table 3 the soils of the county are rated according to their suitability for six kinds of wildlife food and cover, two kinds of water developments, and three groups of wildlife. The categories rated in table 3 are described in the following paragraphs.

Grain and seed crops consists of domestic grains or seed-producing annual herbaceous plants that are planted to produce food for wildlife. Examples are corn, sorghum, wheat, millet, buckwheat, soybeans, and sunflower.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted to furnish food and cover for wildlife. Examples are fescue, brome, bluegrass, timothy, redtop, orchardgrass, reed canarygrass, clover, trefoil, alfalfa, and sericea lespedeza.

Wild herbaceous upland plants are native or introduced perennial grasses or forbs that generally are established naturally and that proved food and cover mainly for upland wildlife. Examples are ragweed, wheatgrass, wild rye, oatgrass, pokeweed, strawberries, beggarweeds, goldenrod, and dandelion.

Hardwood woody plants are deciduous trees, shrubs, and woody vines that produce fruit, nuts, buds, catkins, twigs, or foliage that are used extensively as food by wildlife and that commonly are established naturally but also may be planted. Examples are oak, beech, cherry,

[4] By CLAYTON L. HEINEY, wildlife biologist, Soil Conservation Service.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*

[A rating of 1 denotes well suited; 2 denotes suitable; 3 denotes poorly suited; and 4 denotes not suitable]

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
AbA	Abbottstown silt loam, 0 to 3 percent slopes	2	2	2	2	3	2	2	2	2	2	2
AbA2	Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded	2	2	2	2	3	2	2	2	2	2	2
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	3	3	4	4	2	2	4
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes	1	1	1	1	3	4	4	4	1	1	4
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	2	4
AgD	Arendtsville gravelly loam, 15 to 25 percent slopes	3	2	1	1	3	4	4	4	2	2	4
AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded	4	3	1	1	3	4	4	4	3	2	4
AgE	Arendtsville gravelly loam, 25 to 35 percent slopes	4	3	1	1	3	4	4	4	3	2	4
AgE3	Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded	4	4	1	1	3	4	4	4	3	2	4
AgF2	Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded	4	4	1	1	2	4	4	4	3	2	4
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded	1	1	1	1	3	4	4	4	1	1	4
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
Be	Bermudian silt loam	1	1	1	1	3	4	4	4	1	1	4
BmA	Birdsboro silt loam, 0 to 3 percent slopes	1	1	1	1	3	4	4	4	1	1	4
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
Bn	Bowmansville silt loam	3	2	2	1	2	2	3	4	2	1	3
BoA	Bowmansville silt loam, local alluvium, 0 to 3 percent slopes	2	1	1	1	3	3	3	3	1	1	3
BoB	Bowmansville silt loam, local alluvium, 3 to 8 percent slopes	2	1	1	1	3	3	4	3	1	1	4
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded	2	2	1	2	2	4	4	4	1	2	4
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4

See footnotes at end of table.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded	3	3	2	2	2	4	4	4	3	2	4
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded	3	2	2	2	2	4	4	4	2	2	4
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded	4	4	3	2	2	4	4	4	4	3	4
BrE	Brecknock silt loam, 25 to 50 percent slopes	4	4	3	3	3	4	4	4	4	4	4
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes	2	1	1	1	3	3	3	3	1	1	3
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes	2	1	1	1	3	4	4	4	1	1	4
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes	4	3	1	1	3	4	3	4	3	2	4
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded	3	3	2	2	2	4	4	4	2	2	4
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded	4	4	2	2	2	4	4	4	3	2	4
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded	4	4	2	2	2	4	4	4	3	2	4
Ck	Chewacla silt loam	2	1	1	1	3	3	3	3	1	1	3
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded	1	1	1	1	3	4	4	4	1	1	4
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
CoB3	Conestoga silt loam, 3 to 8 percent slopes, severely eroded	2	2	1	1	3	4	4	4	1	2	4
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded	4	3	1	1	3	4	4	4	3	2	4
CrA	Croton silt loam, 0 to 3 percent slopes	3	2	2	2	2	1	1	1	2	2	1
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded	3	2	2	2	2	3	4	4	2	2	4
Du	Dunning silty clay loam	4	3	3	1	3	1	4	4	3	1	3

See footnotes at end of table.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
EcB	Edgemont channery loam, 3 to 8 percent slopes	2	1	1	1	3	4	4	4	1	1	4
EcC	Edgemont channery loam, 8 to 15 percent slopes	2	1	1	1	3	4	4	4	1	1	4
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded	3	2	1	1	1	4	4	4	2	2	4
EhB	Edgemont very stony loam, 0 to 8 percent slopes	4	3	1	1	3	4	4	4	3	1	4
EhD	Edgemont very stony loam, 8 to 25 percent slopes	4	3	1	1	2	4	4	4	3	1	4
EhE	Edgemont very stony loam, 25 to 70 percent slopes	4	4	3	3	3	4	4	4	4	2	4
GcA	Glenelg silt loam, 0 to 3 percent slopes	1	1	1	2	2	4	4	4	2	2	4
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
GcC	Glenelg silt loam, 8 to 15 percent slopes	2	2	2	2	2	4	4	4	2	2	4
GcC2	Glenelg silt loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
GnA	Glenville silt loam, 0 to 3 percent slopes	2	1	1	1	3	3	3	3	1	1	3
GnB	Glenville silt loam, 3 to 8 percent slopes	2	1	1	1	3	4	4	4	1	1	4
Gu	Guthrie silt loam	3	3	2	2	2	1	1	1	3	2	1
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded	1	1	1	1	3	4	4	4	1	1	4
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded	2	2	2	2	3	4	4	4	2	2	4
HcD	Highfield channery silt loam, 15 to 25 percent slopes	2	2	2	1	3	4	4	4	2	1	4
HcD3	Highfield channery silt loam, 15 to 25 percent slopes, severely eroded	4	4	2	2	2	4	4	4	3	3	4
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes	4	3	2	2	2	4	4	4	3	2	4
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes	4	3	2	2	2	4	4	4	3	2	4
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes	4	4	2	2	2	4	4	4	3	2	4
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded	4	3	2	2	2	4	4	4	3	2	4
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded	3	3	2	2	2	4	4	4	3	2	4

See footnotes at end of table.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded	3	3	2	2	2	4	4	4	3	2	4
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded	4	3	3	3	1	4	4	4	4	3	4
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded	3	3	2	2	2	4	4	4	3	2	4
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded	3	3	2	2	2	4	4	4	3	2	4
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded	4	4	3	3	1	4	4	4	4	3	4
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded	4	4	4	4	4	4	4	4	4	4	4
La	Lamington silt loam	3	2	2	2	2	1	1	1	2	2	1
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded	2	2	1	1	3	4	4	4	1	1	4
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	1	4
Le	Lawrence silt loam	3	3	2	2	2	1	1	1	3	2	1
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded	2	2	1	1	1	4	4	4	1	1	4
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded	3	2	1	1	3	4	4	4	2	1	4
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	1	4
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	1	4
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded	4	4	3	2	3	4	4	4	4	2	4
LhA	Lehigh silt loam, 0 to 3 percent slopes	2	2	2	2	3	3	3	3	2	2	3
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded	2	2	1	1	3	4	4	4	1	2	4
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	2	4
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes	4	3	1	1	3	4	4	4	3	2	4
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded	4	3	2	2	2	4	4	4	2	2	4

See footnotes at end of table.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Me	Melvin and Lindside silt loams	4	3	3	1	1	1	4	4	3	1	3
MoA	Montalto silt loam, 0 to 3 percent slopes	1	1	1	1	3	4	4	4	1	1	4
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MsB	Montalto very stony silt loam, 0 to 8 percent slopes	4	3	1	1	3	4	4	4	3	2	4
MsD	Montalto very stony silt loam, 8 to 25 percent slopes	4	3	1	1	3	4	4	4	3	2	4
MsE	Montalto very stony silt loam, 25 to 50 percent slopes	4	4	1	1	3	4	4	4	3	2	4
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded	2	1	1	1	3	3	3	3	1	1	3
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes	4	2	2	2	2	2	2	2	2	2	3
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes	4	2	2	2	2	3	4	3	3	2	4
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded	1	1	1	1	3	4	4	4	1	1	4
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded	2	2	2	2	3	4	4	4	2	2	4
MvD	Myersville silt loam, 15 to 25 percent slopes	2	2	2	1	3	4	4	4	2	1	4
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded	4	4	2	2	2	4	4	4	3	3	4
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded	2	2	2	2	2	4	4	4	2	2	4
PeC2	Penn silt loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded	3	2	2	2	2	4	4	4	2	2	4
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded	3	2	2	2	2	4	4	4	2	2	4
RaA	Readington silt loam, 0 to 3 percent slopes	2	1	1	1	3	3	3	3	1	1	3
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4

See footnotes at end of table.

TABLE 3.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes	2	1	1	1	3	3	3	3	1	1	3
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded	2	1	1	1	3	3	3	3	1	1	3
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded	2	1	1	1	3	4	4	4	1	1	4
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded	2	2	1	1	3	4	4	4	1	2	
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded	3	2	1	1	3	4	4	4	2	2	4
RhA	Rohrersville silt loam, 0 to 3 percent slopes	3	3	2	2	2	1	1	1	3	2	1
RhB	Rohrersville silt loam, 3 to 8 percent slopes	3	3	2	2	2	3	4	4	3	2	4
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes	4	3	2	2	2	3	[1]3	4	3	2	4
Ro	Rowland silt loam	2	1	1	1	3	3	3	3	1	1	3
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded	3	3	2	3	3	4	4	4	3	4	4
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded	2	2	2	2	2	4	4	4	2	2	4
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded	4	3	2	3	3	4	4	4	3	4	4
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded	4	4	3	3	3	4	4	4	4	4	4
WaA	Watchung silt loam, 0 to 3 percent slopes	3	3	2	2	2	1	1	1	3	2	1
WaB	Watchung silt loam, 3 to 8 percent slopes	3	3	2	2	2	3	4	4	3	2	4
WcA	Watchung very stony silt loam, 0 to 8 percent slopes	4	3	2	2	2	1	[1]2	2	3	2	[2]1
Wd	Wehadkee silt loam	4	3	3	1		1	4	4	3	1	3
WoA	Worsham silt loam, 0 to 3 percent slopes	3	3	2	2	2	1	1	1	3	2	1
WoB	Worsham silt loam, 3 to 8 percent slopes	3	3	2	2	2	2	4	4	3	2	4

[1] Rating is as much as 4 on all slopes over 3 percent.

[2] Rating is as much as 3 if the rating for shallow water developments is as much as 4.

hawthorn, dogwood, viburnums, holly, maple, birch, and poplar. Smaller plants include grape, honeysuckle, blueberry, briers, greenbrier, raspberry, and roses.

Coniferous woody plants are cone-bearing trees and shrubs that are important to wildlife primarily as cover but that also furnish food in the form of browse, seeds, or cones. These trees and shrubs are commonly established naturally, but they also may be planted. Examples are pine, spruce, whitecedar, hemlock, fir, redcedar, juniper, and yew.

Wetland food and cover plants are annual and perennial grasses and grasslike plants on moist to wet sites. These plants do not include submerged or floating aquatic plants that produce the food and cover used mainly by wetland wildlife. Examples of wetland food plants are smartweed, wild millet, bulrushes, sedges, wild rice, switchgrass, reed canarygrass, and cattails.

Shallow water developments are areas of water that have been made by building low dikes or levees, by digging shallow excavations, or by using devices to control the water of marshy streams or channels.

Excavated ponds are dug-out areas or a combination of dug-out areas and low dikes that hold water of suitable quality, suitable depth, and in ample supply for the production of fish or wildlife. Such a pond should have a surface area of at least one-quarter acre and an average depth of 6 feet or more in at least a quarter of the area. Also required is a water table that is permanently high or another source of unpolluted water of low acidity.

Making up the category *openland wildlife* are the birds and mammals commonly found in crop fields, in meadows and pastures, and on nonforested, overgrown land. Among these birds and mammals are quail, ring-necked pheasants, mourning doves, woodcock, cottontail rabbits, meadow larks, killdeer, and field sparrows.

Woodland wildlife consists of birds and mammals commonly found in wooded areas. Examples are ruffed grouse, wild turkeys, wood thrushes, warblers, vireos, deer, squirrels, and raccoon.

Wetland wildlife consists of birds and mammals commonly found in marshes and swamps. Examples are ducks, geese, heron, snipe, rails, coots, muskrat, mink, and beaver.

Managing the soils for wildlife

All the soils in the county are suitable for producing some kinds of wildlife, but some of the soils are more suitable for producing cultivated crops. On the soils in capability classes I, II, III, and IV, crops are more valuable than wildlife, but wildlife may be plentiful on these soils and is a secondary crop. Soils in classes VII and VIII are generally used for wildlife and are best suited to that use and to producing wood products.

Many practices that are used primarily to improve the soils and to increase crop production also benefit wildlife. Contour stripcropping and crop rotation provide a mixture of cover and increase the amount of food and cover that wildlife can use. During winter, cover crops and crop residues are used by wildlife for food and cover. Diversion terraces and grassed waterways provide travel lanes and nesting places. Food and cover for wildlife are increased by fertilization and liming.

Practices used primarily to benefit wildlife supplement the practices used primarily to increase crop yields. Plantings of grasses and legumes along field borders provide nesting places and food for wildlife. If hedgerows are planted on cropland, they furnish travel lanes, food, and cover, and they also fence the field and give some protection to the soils. Small patches of corn, small grain, and soybeans that are planted to supply food for wildlife are particularly valuable in abandoned or idle areas, especially if these patches are located near good cover or between wooded areas and open fields.

Habitat for wetland wildlife can be made or improved by digging ponds in pastures or, for shallow water impoundments, by installing special structures for water control in marshy areas. The ponds can be stocked with fish, and they are also used by migratory waterfowl as resting places. If shrubs and trees are planted around these ponds, they will attract many other kinds of wildlife. Shallow impoundments are breeding grounds and feeding areas for waterfowl and shorebirds. Muskrat, mink, and other furbearers also benefit from these developments. Because many of the soils in the county are not suitable as sites for ponds, the sites should be selected with care before a pond is planned.

The greatest danger to fish in the waters of the county is from pollution and erosion sediments. Fish are killed by industrial waste, sewage, insecticides, and herbicides. Soil erosion is particularly damaging. As sediments are washed into rivers and streams, they settle and cover spawning beds and recently hatched fish. The sediments destroy food and food-producing areas. By filling pools, sediments cause water temperature to rise to a point that is harmful to fish. Erosion of the streambanks is particularly damaging. Commonly this erosion is caused by overgrazing, which should be controlled. The streambanks can also be protected by plantings. But protecting the streambank is not enough. The entire watershed should be protected by carrying out a complete plan that protects every farm and all of the land in the watershed.

Engineering Uses of the Soils [5]

This soil survey report for Adams County contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the soil properties that are important in planning agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, pipelines, and airports and in planning detailed investigations at the intended locations.
4. Locate sources of sand, gravel, and other construction material.
5. Correlate pavement performance to types of soil to develop information that will be useful in designing future roads and maintaining present roads.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.

[5] DONALD MCCANDLESS, JR., engineering specialist, Soil Conservation Service, assisted in writing this subsection.

7. Supplement the information obtained from other published maps, reports, and aerial photographs to make maps and reports that can be used readily by engineers.
8. Estimate the nature of the material encountered when excavating for buildings and other structures.
9. Determine the suitability of soils as sites for the infiltration of waste from septic tanks.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. *It should be emphasized, however, that they may not eliminate the need for sampling and testing at the site of specific engineering works where loads are heavy and where the excavations are deeper than the depths of layers here reported.* Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may not be familiar to engineers, and other terms may have a special meaning in soil science. These terms are defined in the Glossary at the back of the report.

Much of the information in this subsection is in tables. Table 4 gives the engineering test data obtained when the samples of selected soil series were tested. In table 5 are brief descriptions of the soils in the county and estimates of their physical properties. In table 6 are engineering interpretations of these properties.

Engineering classification systems

Two systems of classifying soils are in general use among engineers. In table 5, beginning on page 46, the soils of the county are classified according to both systems.

Most soil engineers classify soil material according to the system approved by the American Association of State Highway Officials (AASHO) (*2*).[6] In this system soil materials are classified in seven principal groups. The groups range from A–1, consisting of gravelly soils of high bearing capacity, to A–7, consisting of clay having low strength when wet. Within each group the relative engineering value of the soil materials is indicated by a group index number. Group indexes range from 0 for the best materials to 20 for the poorest. The group index, when it is used, is shown in parentheses after the symbol for the soil group; for example, A–6 (*1*).

Some engineers prefer the Unified classification system, which was established by the Waterways Experiment Station, Corps of Engineers (*19*). In this system soil materials are identified as coarse grained (eight classes), fine grained (six classes), or highly organic (one class). An approximate classification of soils by this system can be made in the field. Estimated classifications of major horizons of selected soils in Adams County under both systems are given in table 4, beginning on page 40.

Soil test data

To be able to make the best use of the soil maps and the soil survey reports, the engineer should know the physical properties of the soil material and the in-place condition of the soil. After testing the soil material and observing its behavior when used in engineering structures, the engineer can develop design recommendations for the soil units delineated on the soil map.

Samples that represent 13 series taken at 45 locations in Adams County were tested by the Pennsylvania Department of Highways according to standard AASHO procedures. The results of these tests and the classification of each sample, according to both the AASHO and the Unified systems, are given in table 4, beginning on page 40. For the rest of the soils in the county, the data were compiled partly from the reports of nearby counties where soils from the same series had been tested, and partly from evaluation made by the soil scientists who were familiar with the characteristics of the soils in a particular series.

The test data given in table 4 were obtained by mechanical analyses and by testing the soils to determine the liquid limit and plastic limit. The mechanical analyses were made by combining the sieve and hydrometer methods. The percentages of clay obtained by the hydrometer method should not be used as a basis for naming the textural classes of the soils.

The tests to determine liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the soil material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition (*8*).

Table 4 also gives compaction (moisture-density) data for the tested soils. If a soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed maximum dry density. Data showing moisture density are important in earthwork, for, as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it contains approximately the optimum amount of moisture.

Soil properties and engineering interpretations

The properties of the soils and the interpretations most significant to engineers are given in tables 5 and 6. The soil scientists prepared these tables by using the test data of table 4, information from other parts of the report, and their knowledge of other soils that are similar to the soils in this county.

Table 5, beginning on page 46, gives brief descriptions of the soils in Adams County and estimates of important physical properties that affect engineering work. More information that is useful to engineers can be found in the sections "Descriptions of the Soils" and "Formation and Classification of the Soils."

[6] Italicized numbers in parentheses refer to Literature Cited, page 149.

TABLE 4.—*Engineering test data for*

[Tests performed by the Pennsylvania Department of Highways in accordance with

Soil name and location [1]	Parent material	Pennsylvania report No.	Depth	Horizon	Moisture-density [2]	
					Maximum dry density	Optimum moisture
			Inches		*Lb. per cu. ft.*	*Percent*
Arendtsville gravelly loam:						
1.5 miles southwest of Arendtsville (modal). Profile S61Pa-1-9-(1-7) in table 10.	Arendtsville fanglomerate (Triassic).	BH-17751	14-20	B21	105	21
		BH-17752	53-70	C2	105	20
1.5 miles west of Biglerville on township road T-369 (modal). Profile S61Pa-1-8-(1-6) in table 10.	Arendtsville fanglomerate (Triassic).	BH-17749	28-40	B22	116	16
		BH-17750	53-68	C1	117	13
0.25 mile south of Cashtown just north of Mussleman Greenhouse and 60 feet south of telephone pole on Rural Route 01001.	Arendtsville fanglomerate (Triassic).	BF-34133	16-36	B2	108	17
		BF-34134	36-60	C1	110	17
0.5 mile west of Arendtsville on Rural Route 01001 and 250 feet south of Rural Route 01075.	Arendtsville fanglomerate (Triassic).	BF-34135	11-33	B2	110	15
		BF-34136	48-72	C1	108	16
Bowmansville silt loam:						
2 miles south of York Springs on township road T-568 (modal).	Alluvium.	BJ-95	8-18	C1g	102	20
		BJ-96	28-40	C3g	107	17
2 miles north of Gettysburg on township road T-341 (poorer drained).	Alluvium.	BJ-99	13-27	C1g	98	21
		BJ-100	27-45	C2g	94	25
2 miles west of Littlestown on Rural Route 01055 (better drained).	Alluvium.	BJ-91	13-31	C1g	100	20
		BJ-92	31-46	C2g	100	20
Brecknock silt loam:						
3 miles northeast of Gettysburg (modal). Profile S61Pa-1-14-(1-6) in table 10.	Porcelanite (metamorphosed Gettysburg shale).	BH-17761	10-14	B2	105	17
		BH-17762	27-44	C2	113	18
8 miles south of Gettysburg and 0.5 mile west of Marsh Creek and 1.5 miles north of Maryland State line (moderately deep). Profile S61Pa-1-15-(1-5) in table 10.	Porcelanite (metamorphosed Gettysburg shale).	BH-17763	14-22	B22	103	19
		BH-17764	28-38	C1	105	20
3 miles east of York Springs on Rural Route 01050 and 200 feet east of township road T-628 (shallower).	Porcelanite (metamorphosed Gettysburg shale).	BH-34027	8-15	B2	99	20
		BH-34028	26-46	C1	(6)	(6)
2 miles southeast of Fairfield on Rural Route 01072 and 0.4 mile west of township road T-309.	Metamorphosed diabase and porcelanite.	BJ-81	15-25	B2	106	17
		BJ-82	29-55	C1	105	17
Conestoga silt loam:						
1 mile southwest of Hanover (York County), on township road T-468 (modal). Profile S61Pa-1-46 on page 125.	Shale, slate, and schist underlain by limestone.	BJ-127	15-26	B22	107	18
		BJ-128	42-52	C1	95	22
0.12 mile northwest of Bittinger (heavier textured).	Shale, slate, and schist underlain by limestone.	BF-34143	7-42	B2	91	28
		BF-34144	61-120	C1	94	25
0.5 mile southwest of Edgegrove along Rural Route 01048 (shallower).	Shale, slate, and schist underlain by limestone.	BF-34145	13-25	B2	102	21
		BF-34146	34-52	C	(6)	(6)
1 mile northeast of Edgegrove on township road T-476 (shaly solum).	Shale.	BJ-123	37-72	B3	87	27
		BJ-124	72-84	C1	107	20

soil samples taken from 45 soil profiles

standard procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis [2]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	65	56	53	46	37	36	30	21	16	38	14	A-6(1)	GM-GC.
100	91	79	74	65	49	47	39	23	15	39	11	A-6(3)	SM.
------	100	96	90	83	52	48	36	23	18	27	9	A-4(3)	CL.
100	96	81	73	59	27	24	17	11	8	23	1	A-2-4(0)	SM.
100	91	84	79	73	62	58	47	36	31	36	16	A-6(8)	CL.
100	98	88	83	76	62	57	44	30	27	34	12	A-6(6)	ML-CL.
100	82	70	66	57	47	45	39	27	19	38	13	A-6(3)	GM-GC.
100	72	65	60	51	41	39	31	17	11	38	7	A-4(1)	GM.
------	------	100	99	96	87	85	65	37	23	35	8	A-4(8)	ML.
100	98	87	75	40	31	29	21	11	8	34	4	A-2-4(0)	SM.
------	------	------	100	98	98	97	83	49	32	43	13	A-7-5(10)	ML.
------	100	98	95	88	84	83	73	47	32	53	19	A-7-5(14)	MH.
------	------	------	100	97	84	81	68	39	25	41	13	A-7-6(9)	ML.
------	------	------	100	98	85	83	70	52	44	50	25	A-7-6(16)	CL.
------	100	97	91	84	76	74	56	29	18	30	5	A-4(8)	ML.
100	97	93	89	85	75	73	58	32	21	35	12	A-6(9)	ML-CL.
100	82	54	47	38	35	34	28	18	12	36	13	A-2-6(1)	GM-GC.
100	82	48	38	27	22	21	16	11	6	31	6	A-1-b(0)	GM.
100	65	44	38	32	29	28	22	11	6	32	4	A-2-4(0)	GM.
100	36	18	15	12	11	9	7	4	2	37	5	A-1-a(0)	GP-GM.
------	------	------	100	99	87	74	45	24	15	26	[7] NP	A-4(8)	ML.
100	62	51	45	44	36	32	12	4	3	28	NP	A 4(0)	GM.
------	100	98	97	93	90	88	78	51	37	37	14	A-6(10)	ML-CL.
100	99	91	88	86	80	78	68	53	46	58	28	A-7-5(19)	M-H-CH.
------	------	100	99	98	92	88	79	68	63	63	33	A-7-5(20)	MH-CH.
------	100	99	98	94	85	82	74	59	54	56	25	A-7-5(17)	MH-CH.
100	95	73	68	65	60	58	50	36	29	41	14	A 7 6(7)	ML-CL.
100	46	32	27	20	15	14	12	9	8	35	10	A-2-4(0)	GM-GC.
------	100	99	98	95	86	84	77	71	68	66	27	A-7-5(19)	MH.
[8] 100	71	49	40	28	20	19	18	16	14	47	18	A-2-7(0)	GM-GC.

See footnotes at end of table.

TABLE 4.—*Engineering test data for soil*

Soil name and location [1]	Parent material	Pennsylvania report No.	Depth	Horizon	Moisture-density [2]	
					Maximum dry density	Optimum moisture
			Inches		*Lb. per cu. ft.*	*Percent*
Highfield channery silt loam:						
3.5 miles southwest of Fairfield (modal). Profile S61Pa-1-12-(1-7) in table 10.	Metarhyolite and some greenstone.	BH-17757	18-24	B22	119	15
		BH-17758	38-42	C	124	13
0.4 mile northeast of Wenksville (modal). Profile S61Pa-1-11-(1-6) in table 10.	Metarhyolite.	BH-17755	17-25	B21	111	15
		BH-17756	30-39	B3	110	16
175 feet southeast of Cumberland County line on Rural Route 01012 (toward Montalto).	Metarhyolite.	BF-34139	10-26	B2	109	15
		BF-34140	36-48	C	115	13
3 miles southeast of Abbottstown along township road T-502 (micaceous C horizon).	Schist.	BF-34141	13-28	B2	115	15
		BF-34142	28-50	C1	130	10
Legore channery silt loam:						
3 miles east of Gettysburg and 1.5 miles south of U.S. Highway No. 30 on township road T-484 (modal). Profile S61Pa-1-19 on page 131.	Diabase.	BH-34025	8-13	B2	106	19
		BH-34026	22-42	C1	117	17
5 miles east of York Springs on Rural Route 01009 (heavier textured and less fragments).	Diabase.	BH-38477	9-17	B2	92	25
		BH-38478	24-36	C1	100	22
3 miles north of Hampton (shallower).	Diabase.	BH-38479	6-14	B3	115	18
		BH-38480	33-53	C2	135	12
Montalto silt loam:						
4.5 miles southeast of Bermudian on township road T-620 and 0.5 mile north of township road T-652 (modal). Profile S61Pa-1-22 on page133.	Diabase.	BH-34031	12-21	B22	88	29
		BH-34032	36-50	C1	104	23
1.5 miles southeast of Fairfield on Rural Route 01072 and 0.5 mile north of township road T-318 (lighter textured).	Diabase.	BJ-83	17-31	B2	92	29
		BJ-84	36-46	C1	98	22
Montalto very stony silt loam:						
30 feet southeast of Cumberland County line on Rural Route 01012 (more clayey).	Diabase.	BF-34137	19-30	B2	94	26
		BF-34138	36-45	C1	88	30
Mount Lucas silt loam:						
2 miles northwest of Hampton and 105 feet west and 130 feet north on T-572 (modal). Profile S61Pa-1-17-(1-6) in table 10.	Intrusive diabase.	BH-17767	15-21	B22	107	21
		BH-17768	33-38	C2	119	14
6 miles southwest of Gettysburg and 3 miles southeast of Fairfield (more plastic).	Intrusive diabase.	BJ-125	14-24	B2g	104	21
		BJ-126	29-40	C1	112	15
3 miles south of Gettysburg (deeper)	Intrusive diabase.	BJ-87	16-26	B2	113	17
		BJ 88	32-41	C1g	112	16
3 miles northeast of Gettysburg (shallower). Profile S61Pa-1-16-(1-6) in table 10.	Intrusive diabase.	BH-17765	11-18	B21	101	24
		BH 17766	28-39	C1	129	13
Myersville silt loam:						
2 miles south of Mount Hope near top of ridge south of Copper Run (modal).	Metabasalt.	BH-38467	14-27	B2	109	19
		BH-38468	38-48	C1	106	19
miles southwest of Fairfield on State Route 16 and 0.9 mile northwest of State Route 116 (deeper solum).	Metabasalt.	BH-38471	10-18	B21	97	22
		BH-38472	43-56	C1	103	20

samples taken from 45 soil profiles—Continued

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	70	58	53	48	39	37	24	13	8	32	7	A-4(1)	GM-GC.
100	74	57	50	46	33	30	19	8	4	28	3	A-2-4(0)	GM.
100	99	84	73	60	51	50	42	23	16	32	7	A-4(3)	ML CL.
100	73	60	54	45	39	38	31	18	12	31	6	A-4(1)	GM.
100	75	67	63	55	47	46	39	24	17	40	13	A 6(3)	GM-GC.
100	80	63	53	37	29	27	21	11	8	35	6	A-2-4(0)	GM.
100	89	82	75	65	52	50	42	28	21	48	19	A-7-6(8)	ML-CL.
100	76	52	42	33	21	20	16	11	8	42	13	A-2-7(0)	GM.
100	93	92	92	73	55	52	44	30	24	45	21	A-7-6(9)	CL.
------	------	100	99	67	39	35	25	15	12	37	9	A-4(1)	SM.
------	------	------	100	99	91	88	76	49	37	65	29	A-7-5(20)	MH.
------	------	------	100	85	66	63	48	28	19	48	15	A-7-5(9)	ML.
------	100	99	99	72	47	44	35	24	19	40	14	A-6(4)	SM-SC.
------	100	98	93	50	16	13	8	4	3	NP	NP	A-1-b(0)	SM.
------	100	99	98	90	80	78	69	50	37	55	22	A-7-5(16)	MH.
------	96	91	82	62	47	44	34	22	16	42	14	A-7-6(4)	SM.
------	------	100	99	94	78	76	65	48	38	54	19	A-7-5(14)	MH.
------	95	87	81	62	38	34	23	18	14	49	12	A-7 5(1)	SM.
100	97	96	96	94	90	89	80	55	39	58	23	A-7-5(17)	MH.
100	82	80	80	76	65	63	52	33	24	58	16	A-7-5(11)	MH.
------	------	100	99	81	57	54	43	28	21	39	14	A-6(6)	ML-CL.
------	------	99	98	68	29	24	15	7	5	28	NP	A-2-4(0)	SM.
------	------	------	100	87	73	70	60	40	31	43	15	A-7-6(10)	ML-CL.
------	------	------	100	69	41	38	30	21	16	39	12	A-6(2)	SM-SC.
------	------	100	99	79	59	56	45	27	19	35	12	A-6(6)	ML-CL.
------	------	100	99	76	56	53	40	24	17	39	14	A-6(6)	ML-CL.
100	98	98	98	81	69	67	55	36	27	50	23	A-7-6(14)	ML-CL.
------	100	99	98	59	31	28	16	9	5	30	6	A-2-4(0)	SM-SC.
100	95	85	80	72	58	55	43	27	19	39	8	A-4(5)	ML.
100	69	60	57	52	41	38	29	17	10	37	5	A-4(1)	GM.
100	96	90	87	81	74	72	63	45	36	56	20	A-7-5(15)	MH.
100	70	62	60	47	32	30	23	14	11	39	7	A-2-4(0)	GM.

See footnotes at end of table.

TABLE 4.—*Engineering test data for soil*

Soil name and location [1]	Parent material	Pennsylvania report No.	Depth	Horizon	Moisture-density [2]	
					Maximum dry density	Optimum moisture
			Inches		*Lb. per cu. ft.*	*Percent*
Myersville silt loam—Continued						
2 miles southeast of New Oxford and 90 feet south of Rural Route 01051 (lighter textured).	Metabasalt.	BH–38469 BH–38470	13–23 41–55	B21 C1	109 (6)	16 (6)
Penn silt loam:						
1,900 feet northwest of Hunterstown on State Route 394 (modal). Profile S61Pa–1–43 on page 135.	Red shale (Gettysburg formation).	BJ–121 BJ–122	13–23 27–41	B2 C1	107 (6)	18 (6)
0.5 mile southeast of Mummasburg on Rural Route 01002 and 840 feet southwest of State Route 889 (toward Lansdale).	Red shale (Gettysburg formation).	BH–38465 BH–38466	8–16 23–34	B2 C1	108 (6)	17 (6)
2 miles southeast of New Oxford and 90 feet south of Rural Route 01051 (deeper).	Siltstone (New Oxford formation).	BH–38483 BH–38484	10–18 32–46	B21 C1	120 121	13 12
Reaville shaly silt loam:						
2 miles southeast of York Springs on Rural Route 01050 (modal). Profile S61Pa–1–10–(1–4) in table 10.	Shale (Gettysburg formation).	BH–17753 BH–17754	8–12 15–22	B2t C	109 108	17 16
5 miles southwest of Gettysburg on township road T–327 (modal). Profile S61Pa–1–13–(1–4) in table 10.	Shale (Gettysburg formation).	BH–17759 BH–17760	9–13 15–25	B2 C1	103 104	16 21
2 miles northwest of Gettysburg on township road T–338 (toward Lehigh).	Shale (Gettysburg formation).	BH–38475 BH–38476	8–13 16–24	B2t C1g	102 106	18 19
0.75 mile southeast of Mummasburg on State Route 889 (deeper).	Shale (Gettysburg formation).	BH–38473 BH–38474	9–13 18–24	B2t C1g	102 102	21 20
Rowland silt loam:						
3 miles west of Littlestown on township road T–430 (modal). Profile S61Pa–1–37– on page 137.	Alluvium.	BJ–89 BJ–90	15–25 25–48	C1g C2g	109 106	16 18
0.75 mile north of Five Points (Bowlder) and 5 miles south of York Springs (clayey).	Alluvium.	BJ–93 BJ–94	9–16 29–41	C1g C3g	92 100	26 24
2 miles southwest of Bermudian on township road T-581 (lighter textured).	Alluvium.	BH–34029 BH–34030	10–18 21–46	C1 C2g	114 116	14 13
Watchung silt loam:						
3 miles south of Gettysburg and 60 feet north of township road T-411 (modal). Profile S61Pa–1–35 on page 138.	Diabase.	BJ–85 BJ–86	18–25 30–40	B22g C1g	97 106	22 16
In Gettysburg National Military Park north of Devils Den at northeastern base of Little Round Top (clayey).	Alluvium.	BJ–97 BJ–98	17–32 32–43	B2g B3g	98 109	21 18
3 miles northeast of Hampton (shallower)	Alluvium.	BH–38481 BH–38482	6–13 25–35	B21g C1g	102 110	19 17

[1] Soils that have profile numbers are described in the subsection "Descriptions of the Soil Series."

[2] Based on AASHO Designation T 99–57, The Moisture-Density Relations of Soils, Method A (*2*).

[3] According to the AASHO Designation T 88–57(*2*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses data used in this table are not suitable for use in naming textural classes for soils.

[4] Based on AASHO Designation M 145–49 (*2*).

samples taken from 45 soil profiles—Continued

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
3-in.	¾-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	72	60	55	47	40	39	30	21	14	43	10	A-5(1)	GM.
[9] 100	15	9	8	7	6	5	4	2	1	34	8	A-2-4(0)	GP-GM.
------	100	98	93	87	73	71	62	44	37	37	15	A-6(10)	CL.
------	99	45	20	15	12	12	10	8	7	37	16	A-2-6(0)	GP-GC.
100	95	76	64	59	56	53	42	25	15	25	3	A-4(4)	ML.
100	42	36	33	31	28	25	17	11	8	27	6	A-2-4(0)	GM-GC.
------	100	97	92	86	52	47	38	24	15	22	4	A-4(3)	ML-CL.
------	------	99	98	91	52	47	35	22	16	23	7	A-4(3)	ML-CL.
100	89	83	79	71	67	66	53	26	18	27	5	A-4(6)	ML-CL.
100	54	41	37	32	29	28	21	12	9	27	5	A-2-4(0)	GM-GC.
100	99	85	72	58	49	48	40	22	14	29	6	A-4(3)	SM-SC.
100	64	38	32	25	21	20	16	10	8	28	6	A-1-b(0)	GM-GC.
------	100	87	72	61	58	57	49	29	17	28	6	A-4(5)	ML-CL.
100	99	85	73	66	62	61	52	31	19	29	7	A-4(5)	ML-CL.
100	96	88	80	71	65	64	57	38	29	34	8	A-4(6)	ML.
100	93	81	71	58	50	49	45	31	22	34	9	A-4(3)	SM-SC.
------	100	99	99	96	87	83	65	37	25	26	5	A-4(8)	ML-CL.
------	------	------	------	100	85	80	65	45	35	39	17	A-6(11)	CL.
------	------	------	100	98	95	94	81	55	37	49	17	A-7-5(13)	ML.
------	100	98	96	91	86	85	78	64	56	60	33	A-7-6(20)	CH.
100	99	97	95	76	44	40	31	16	11	24	3	A-4(2)	SM.
------	100	92	87	67	43	41	33	21	13	28	6	A-4(2)	SM-SC.
100	99	99	99	98	93	92	85	66	55	64	35	A-7-6(20)	CH.
100	98	96	95	86	58	54	45	31	20	40	15	A-6(7)	ML-CL.
------	------	------	100	99	96	95	81	58	47	57	30	A-7-6(19)	CH.
------	100	99	99	90	62	58	45	27	20	41	16	A-6-7(8)	ML-CL.
------	------	------	100	97	84	81	65	42	29	40	15	A-6(10)	ML-CL.
------	------	100	99	85	55	51	38	23	15	36	12	A-6(5)	ML-CL.

[3] Based on the Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Corps of Engineers (*19*). SCS and BPR have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. An example of a borderline classification obtained by this use is ML-CL.

[6] Insufficient material passing No. 4 sieve for a moisture-density test to be made.

[7] NP means nonplastic.

[8] Laboratory test data not corrected for the 7 percent of the horizon that was larger than 3 inches.

[9] Laboratory test data not corrected for the 50 percent of the horizon that was larger than 3 inches.

TABLE 5.—*Brief description of soils and*

[Absence of data indicates

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
AbA	Abbottstown silt loam, 0 to 3 percent slopes.	1½	2–5	Soils in depressions of uplands; 2 to 5 feet of somewhat poorly drained silt loam over shale and sandstone; fragipan in the subsoil.	0–9
AbA2	Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded.				9–48
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded.				
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes.	6+	5–20	Soils on uplands; 5 feet or more of well-drained gravelly loam or silt loam developed from Arendtsville fanglomerate, which consists of rocks of varying mineralogy set in a red sandy matrix.	0–9
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded.				9–40
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded.				40–68
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded.				
AgD	Arendtsville gravelly loam, 15 to 25 percent slopes.				
AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded.				
AgE	Arendtsville gravelly loam, 25 to 35 percent slopes.				
AgE3	Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded.				
AgF2	Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded.				
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded.	4+	3½–8	3½ feet or more of well-drained gravelly silt loam over limestone conglomerate.	0–14
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded.				14–64
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded.				64–70
Be	Bermudian silt loam.	3+	3–6	Soil on flood plains; 3 to 5 feet of well-drained silt loam over alluvial material washed from shale and sandstone uplands. Subject to flooding about once every 3 or 4 years.	0–10
					10–18
					18–36
BmA	Birdsboro silt loam, 0 to 3 percent slopes.	2+	3–12	Soils on stream terraces above flood level; 3 to 5 feet or more of well-drained silt loam or other loamy material over old streambeds or alluvial material washed mostly from shale and sandstone areas.	0–9
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded.				9–30
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded.				30–54
Bn	Bowmansville silt loam.	0–1½	3–8	Soils on flood plains; 2½ to 5 feet of poorly drained silt loam over alluvial material washed mostly from areas of Lansdale soils underlain by shale and sandstone. Water table is high; occasional floods.	0–8
BoA	Bowmansville silt loam, local alluvium, 0 to 3 percent slopes.				8–28
BoB	Bowmansville silt loam, local alluvium, 3 to 8 percent slopes.				28–40
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded.	3+	1½–3	Soils on upland; 1½ to 4 feet of well-drained silt loam or channery silt loam over metamorphosed shale and sandstone.	0–9
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded.				9–28
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded.				28–38
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded.				
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded.				
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded.				
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded.				
BrE	Brecknock silt loam, 25 to 50 percent slopes.				

their estimated properties

estimate was not made]

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
							2.0–6.3	0.22	5.0–5.6			
ML–CL	A–4		95–100	90–95	70–90	55–85	0.2–0.63	.16	5.0–5.6	14	117	Moderate.
							2.0–6.3	.12	5.5–6.0			
GM–GC or CL.	A–4 or A–6.		60–80	55–75	55–75	40–55	2.0–6.3	.15	4.5–5.5	17	110	Low.
GM or SM	A–4 or A–6.		65–80	60–75	50–70	40–50	2.0–6.3	.15	4.0–5.5	17	112	Low.
							2.0–6.3	.26	5.6–6.4			
SM or ML	A–4		75–90	65–80	50–65	40–70	0.63–2.0	.20	5.6–6.0	18	113	Low.
GM	A 2 or A4.		60–70	50–60	30–50	25–40	0.63–2.0	.16	6.0–7.0	10	117	Low.
							2.0–6.3	.20	5.2–6.0			
ML	A–4		90–100	80–90	65–85	60 70	2.0–6.3	.20	5.2–6.0	16	105	Low.
GM	A–2 or A–4.		60–75	30–50	25–40	20–40	2.0–6.3	.15	5.2–6.0	16	110	
							2.0–6.3	.20	5.2–6.0			
ML–CL	A–4		90–100	80–90	70–80	60–70	2.0–6.3	.20	5.2–6.0	16	105	Low.
GM	A–2		60–75	20–40	20–30	15–35	2.0–6.3	.12	5.2–6.0	10	116	Low.
							2.0–6.3	.19	5.5–6.0			High.
ML	A–4 or A–7.		95–100	95–100	85–95	85–95	0.2–0.63	.19	5.5–6.0	20	100	High.
SM	A–2 or A–4.		95–100	85–100	60–85	30–50	0.2	.13	5.5–6.0	20	103	High.
							2.0–6.3	.23	5.5–6.2			
ML, GM	A–2 or A–4.		50–95	50–90	60–80	30–75	0.63–2.0	.19	5.0–6.2	17	104	Low.
ML–CL or GM.	A–4		50–90	45–85	55–75	40–75	0.63–2.0	.16	5.0–5.8	17	108	Low.

TABLE 5.—*Brief description of soils and*

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes.	2	5–50+	Soils in depressions and along drainageways of uplands; more than 3 feet of moderately well drained gravelly silt loam; developed from alluvium and colluvium washed from areas of Highfield and Myersville soils.	0–11 11–37 37–44
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes.				
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes.				
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded.	3+	1–4	Soils on uplands; 1 to 2 feet of well-drained channery silt loam over greenstone or metarhyolite of South Mountain.	0–9 0–16
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded.				
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded.				
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded.				
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded.				
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded.				
Ck	Chewacla silt loam.	0	3–8	Soil on flood plains; 3 feet or more of moderately well drained silt loam or other loamy soil over alluvial material washed from soils developed from weathered diabase, phyllite, and schist.	0–10 10–20 20–38
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded.	5+	4–15	Soils on uplands; 3 to 6 feet of well-drained silt loam over limestone or calcareous material.	0–10 10–42 42–52
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded.				
CoB3	Conestoga silt loam, 3 to 8 percent slopes, severely eroded.				
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded.				
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded.				
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded.				
CrA	Croton silt loam, 0 to 3 percent slopes.	0– ½	3–6	Soils in depressions and along drainageways of uplands; 2½ to 5 feet of poorly drained silt loam over weathered shale and sandstone or metamorphosed shale and sandstone; subsoil is silty clay to clay, is sticky and plastic, and contains a fragipan.	0–10 10–45 45–55
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded.				
Du	Dunning silty clay loam.	0	3–15	Soil on flood plain. 3 to 6 feet of very poorly drained alluvial soils washed from limestone or calcareous material; silty clay surface layer and fine-textured subsoil. Frequent flooding.	0–11 11–37 37
EcB	Edgemont channery loam, 3 to 8 percent slopes.	6+	3–12	Soils in mountainous areas of uplands; 2 to 4 feet or more of well-drained channery loam over material weathered mostly from quartzite. Many areas are steep and stony.	0–9 9–33 33–45
EcC	Edgemont channery loam, 8 to 15 percent slopes.				
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded.				
EhB	Edgemont very stony loam, 0 to 8 percent slopes.				
EhD	Edgemont very stony loam, 8 to 25 percent slopes.				
EhE	Edgemont very stony loam, 25 to 70 percent slopes.				

their estimated properties—Continued

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
							2. 0–6. 3	0. 18	5. 2–5. 8			
SM or ML	A–4		90–100	65–75	50–70	45–55	0. 63–2. 0	. 17	5. 2–5. 8	14	111	Low.
SM	A–4		85–95	50–60	35–55	30–50	0. 2–0. 63	. 17	5. 2–5. 8	14	113	Low.
							2. 0–6. 3	. 15	5. 2–6. 0			
GM	A–2		30–45	25–40	20–35	15–30	2. 0–6. 3	. 13	5. 2–6. 0	13	120	Low.
							2. 0–6. 3	. 19	5. 5–6. 6			
ML, SM	A–4		90–100	80–95	40–60	40–55	2. 0–6. 3	. 19	5. 5–6. 6	17	105	Low.
SM	A–4		85–100	45–60	40–55	35–50	2. 0–6. 3	. 16	5. 5–6. 6	17	110	Low.
							2. 0–6. 3	. 25	5. 6–6. 6			
ML–CL, MH–CH.	A–4 to A–7.		75–100	70–100	70–100	60–90	2. 0–6. 3	. 25	5. 8–6. 2	20	105	Moderate.
MH–CH	A–4 to A–7.		95–100	90–100	75–95	70–90	2. 0–6. 3	. 17	5. 8–7. 0	23	100	Moderate.
							2. 0–6. 3	. 24	5. 2–6. 0			
CL	A–4 to A–7		90–100	75–100	90–100	80–95	<0. 2	. 22	5. 2–6. 0	16	112	High.
SM–SC	A–2 or A–4		70–90	55–80		30–50	0. 2–0. 63	. 15	5. 2–5. 8	11	122	Moderate.
							<0. 2	. 19	5. 8–7. 0			
MH–CH	A–7		90–100	90–100	85–95	75–90	<0. 2	. 15	5. 8–7. 0	21	100	High.
SC or CL	A–4		90–100	90–100	80–90	45–60	<0. 2	. 15	5. 8–7. 0	16	105	High.
							2. 0–6. 3	. 16	4. 5–5. 5			
GM	A–2		45–80	40–75	45–65	20–35	2. 0–6. 3	. 11	4. 5–5. 5	12	115	Low.
GM	A–2		40–75	35–70	50–60	15–30	2. 0–6. 3	. 11	5. 0–5. 5	12	120	Low.

TABLE 5.—*Brief description of soils and*

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
GcA	Glenelg silt loam, 0 to 3 percent slopes.	5 +	3-20 +	Soils on uplands; 2 to 3 feet of well-drained silt loam over phyllite or schist. Some areas are micaceous and channery.	0–7
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded.				7–21
GcC	Glenelg silt loam, 8 to 15 percent slopes.				21–26
GcC2	Glenelg silt loam, 8 to 15 percent slopes, moderately eroded.				
GnA	Glenville silt loam, 0 to 3 percent slopes.	2–3	3–20+	Soils in depressions, along drainageways, and at the base of slopes of uplands; 3 to 5 feet of moderately well drained silt loam over phyllite or schist.	0–9
GnB	Glenville silt loam, 3 to 8 percent slopes.				9–33
					33–40
Gu	Guthrie silt loam.	0	4–15	Soil in depressions of uplands; 2½ to 6 feet of poorly drained silt loam over limestone or calcareous material. Subsoil is fine textured and is sticky and plastic.	0–10
					10–30
					30–45
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded.	6+	3–8	Soils on uplands; 2½ to 4 or more feet of well-drained channery silt loam over metarhyolite or material that weathered from metarhyolite and similar rocks.	0–10
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded.				10–30
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded.				30–45
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded.				
HcD	Highfield channery silt loam, 15 to 25 percent slopes.				
HcD3	Highfield channery silt loam, 15 to 25 percent slopes, severely eroded.				
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes.				
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes.				
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes.				
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded.	4+	1–3	Soils on uplands; 3 feet or less of well-drained silt loam over limestone or calcareous material.	0–7
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded.				7–16
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded.				16–24
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	2–6	½–3	Soils on uplands; ½ to 2 feet of well-drained shaly silt loam over red Triassic shale and sandstone; droughty.	0–8
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded.				8–14
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded.				
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded.				
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded.				
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded.				
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded.				
La	Lamington silt loam.	0	3–12	Soil on stream terraces; 2½ to 5 feet of poorly drained silt loam derived from alluvial material washed mostly from areas of shale and sandstone. Subsoil is fine textured.	0–11
					11–31
					31–36
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded.	3	2½–5	Soils on uplands; 2 to 3 feet of well-drained loamy material over sandstone and con-	0–9
					9–24

their estimated properties—Continued

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
ML-CL	A-5		85-100	80 95	70-90	65-80	2. 0-6. 3	0. 20	5. 0-5. 5			
ML-CL	A-5		85-100	80-95	50-70	50-65	2. 0-6. 3	. 20	5. 0-5. 5	15	116	Moderate.
							2. 0-6. 3	. 20	5. 0-5. 5	16	112	Moderate.
							2. 0-6. 3	. 20	5. 0-6. 0			
ML-CL	A-5		90-100	85-95	80-95	75-90	0. 2 0. 63	. 19	5. 0-6. 0	15	116	Moderate.
MH CH	A-6		90-100	85-95	65 80	65-80	0. 63-2. 0	. 19	5. 0-6. 0	16	112	Moderate.
							<0. 2	. 20	5. 8-7. 0			
CH	A-7		95-100	85-100	80-100	80-95	<0. 2	. 19	5. 8-7. 0	21	100	High.
CL	A-6		95-100	80-95	75-90	50 65	<0. 2	. 17	5. 8-7. 0	16	110	High.
							2. 0-6. 3	. 20	5. 2-5. 8			
GM or ML-CL.	A-4		65-80	60-75	50-70	30-55	2. 0-6. 3	. 21	5. 2-5. 8	15½	113	Low.
GM	A-2		55-65	50-60	35-55	25-35	2. 0-6. 3	. 25	5. 2-5. 8	13	120	Low.
							2. 0-6. 3	. 25	6. 0-7. 0			
ML-CL	A-4		95-100	90-100	80-95	80-90	2. 0-6. 3	. 20	6. 0-7. 0	20	105	Low.
GM	A-2		60-75	50-65	40-60	25-35	2. 0-6. 3	. 15	6. 0-7. 0	15	110	Low.
							2. 0-6. 3	. 19	4. 5-5. 6			
GW-GM or GM.	A-1 or A-2.		25-45	15-35	10-30	5-15	2. 0-6. 3	. 13	4. 5-5. 8	12	116	Low.
							2. 0-6. 3	. 21	5. 2-6. 2			
ML-CL	A-4		75-95	70-85	55-75	55-65	0. 63-2. 0	. 16	5. 2-6. 2	17	105	Low.
GM	A-2 or A-4.		55-65	50-60	35-55	20-40	0. 63-2. 0	. 15	5. 2-6. 2	15	115	Low.
							2. 0-6. 3	. 18	5. 2-6. 2			
SM-SC	A-2 or A-4		80-95	70-85	55-75	30-45	2. 0-6. 3	. 16	5. 2-6. 2	11	120	Low.

TABLE 5.—*Brief description of soils and*

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded.			glomerate.	24–32
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded.				
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded.				
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded.				
Le	Lawrence silt loam.	1½	4–15	Soil in depressions of uplands; 3 feet or more of somewhat poorly drained silt loam over limestone or calcareous material. Subsoil is sticky and plastic.	0–11 11–62 62–70
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded.	3+	2–15	Soils on uplands; 1 to 2½ feet of well-drained channery silt loam over diabase or weathered diabase.	0–8 8–22 22–62
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded.				
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded.				
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded.				
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded.				
LhA	Lehigh silt loam, 0 to 3 percent slopes	2	3–5	Soils on uplands; 2 to 3 feet of moderately well drained or somewhat poorly drained silt loam over porcelanite. Silt pan below plow layer.	0–8 8–30 30–47
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded.				
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded.	2	2–4	Soils on uplands; 1 to 2 feet of moderately well drained or somewhat poorly drained silt loam over porcelanite. Silt pan below plow layer.	0–7 7–16 16–24
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded.				
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes.				
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded.	4+	3–20+	Soils on uplands; less than 2 feet of well-drained loam or channery loam over material that weathered from phyllite, gneiss, and schist; some areas are micaceous.	0–7 7–18 18–48
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded.				
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded.				
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded.				
Me	Melvin and Lindside silt loams.				
	Melvin soil:	0–1½	3–8	Soil on flood plains; more than 3 feet of poorly drained or somewhat poorly drained silt loam developed from material washed from areas of limestone or calcareous shale or schist.	0–12 12–18 18–46
	Lindside soil:	2½	5–15	Soil on flood plains; 3 feet or more of moderately well drained alluvial material washed from limestone uplands. Plow layer is silt loam over silty clay loam or clay loam that contains scattered lenses of sand and gravel.	0–8 8–18 18–46
MoA	Montalto silt loam, 0 to 3 percent slopes	4+	4–10	Soils on uplands; 2½ to 5 feet of well-drained silt loam over clayey material that weathered from diabase. Some areas	0–9 9–36
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded.				

their estimated properties—Continued

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
GM	A-2		75–90	65–80	30–55	25–35	2. 0–6. 3	0. 13	5. 2–6. 2	11	125	Low.
							0. 63–2. 0	. 22	6. 0–7. 0			
MH–CH	A-7		95–100	90–100	95–100	65–95	0. 2–0. 63	. 20	6. 0–7. 0	17	100	High.
GM	A-2		70–80	50–60	25–45	25–35	0. 63–2. 0	. 16	6. 0–7. 0	15	110	Low.
							2. 0–6. 3	. 20	5. 1–6. 2			
CL or SM	A-6 or A-7		95–100	90–95	80–100	40–60	0. 63–2. 0	. 19	5. 1–6. 6	19	105	Moderate
SM	A-2 or A-4		95–100	85–95	65–85	30–50	0. 63–2. 0	. 19	5. 1–6. 6	17	115	Low.
							2. 0–6. 3	. 23	5. 5–6. 5			
ML–CL	A-4 or A-6.	5–20	75–95	70–90	65–85	60–80	0. 2–0. 63	. 22	5. 2–6. 5	17	108	Moderate.
GM, GC, or CL.	A-2 or A-4.	10–30	50–65	45–60	45–65	30–60	0. 63–2. 0	. 20	5. 5–6. 5	17	108	Low.
							2. 0–6. 3	. 23	5. 5–6. 5			
ML	A-4	10–20	70–90	65–85	55–75	55–75	0. 2–0. 63	. 21	5. 2–6. 5	15	108	Moderate.
GM	A-2 or A-4.	15–40	50–65	45–60	35–55	30–50	0. 63–2. 0	. 19	5. 5–6. 5	14	110	Low.
							2. 0–6. 3	. 20	5. 2–6. 0			
GM	A-2 or A-5.	0–10	55–70	45–65	40–60	35–50	2. 0–6. 3	. 17	5. 2–6. 0	18	108	Low.
GM	A-2 or A-5.	10–30	50–65	40–55	35–50	30–45	2. 0–6. 3	. 17	5. 2–6. 0	18	107	Low.
							0. 63–2. 0	. 22	6. 0–7. 0			
ML–CL, ML.	A-6		100	95–100	85–95	80–90	0. 2–0. 63	. 21	6. 0–7. 0	21	105	Moderate.
ML–CL, ML.	A-4		100	95–100	85–95	65–80	<0. 2	. 21	6. 0–7. 0	21	100	Moderate.
							2. 0–6. 3	. 22	7. 0			Moderate.
CL	A-6			100	90–95	70–80	0. 63–2. 0	. 13	6. 5	18	104	Moderate.
ML	A-4			100	75–95	50–60	0. 63–2. 0	. 11	6. 0	13	118	Moderate.
							2. 0–6. 3	. 16	5. 5–6. 4			
MH	A-7		95–100	90–100	85–95	80–90	0. 2–0. 63	. 18	5. 8–6. 2	25	90	Moderate.

TABLE 5.—*Brief description of soils and*

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded.			are channery, and in most places there are large boulders. Subsoil is fine textured.	36–50
MsB	Montalto very stony silt loam, 0 to 8 percent slopes.				
MsD	Montalto very stony silt loam, 8 to 25 percent slopes.				
MsE	Montalto very stony silt loam, 25 to 50 percent slopes.				
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded.	2	4–10	Soils on uplands; 2½ to 5 feet of moderately well drained to somewhat poorly drained silt loam over loamy material that weathered from diabase. Some areas are channery, and in many places there are large boulders. Subsoil is fine textured.	0–8
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded.				8–28
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded.				28 39
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes.				
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes.				
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded.	5+	2½–5	Soils on uplands, mostly in the vicinity of South Mountain; 2 to 4 feet or more of well-drained silt loam or channery silt loam over greenstone or similar weathered material. Some areas are very stony and contain boulders.	0–9
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded.				9–38
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded.				38–48
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded.				
MvD	Myersville silt loam, 15 to 25 percent slopes.				
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded.				
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded.	4+	1–4	Soils on uplands; 1½ to 3 feet of well-drained silt loam and shaly silt loam over weathered red shale and some red sandstone.	0–8
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded.				8–23
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded.				23–41
PeC2	Penn silt loam, 8 to 15 percent slopes, moderate eroded.				
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded.				
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded.				
RaA	Readington silt loam, 0 to 3 percent slopes.	2	2½–5	Soils on uplands; 2 to 4 feet of moderately well drained silt loam over weathered red shale or shale and sandstone.	0–10
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded.				10–40
					40–46
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes.	0–1½	5–15	Moderately well drained to somewhat poorly drained silt loam over silty clay loam; lenses of loam or clayey sand occur in some areas. Material is alluvium and colluvium derived mainly from uplands underlain by limestone or other calcareous rock. Properties of Wiltshire soil described here. For properties of Readington soil, see description of Readington silt loam.	0–7
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded.				7–17
					17–33
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	1½	½–2	Soils on uplands; ½ to 1½ feet of somewhat poorly drained shaly silt loam over acid, red shale or red shale and fine red sandstone. Soils droughty at times.	0–8
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded.				8–12
					12–22

their estimated properties—Continued

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
SM	A–2 or A–4.		75–90	65–80	60–75	25–40	2. 0–6. 3	0. 14	5. 8–6. 6	25	100	Low.
							2. 0–6. 3	. 19	5. 8–6. 5			
ML–CL	A–6		95–100	90–100	75 95	55–65	0. 63–2. 0	. 17	6. 0–6. 8	20	107	Moderate.
SM–SC	A–4		95–100	90–100	70–90	40–50	0. 2–0. 63	. 16	6. 0–7. 0	14	120	Low.
							2. 0–6. 3	. 15	5. 5–5. 8			
ML, MH, or GM.	A–4 to A–7.		60–90	55–85	55–75	40–70	0. 63–2. 0	. 21	5. 2–5. 8	19	105	Low.
GM	A–2 or A–4.		55–65	50–60	35–55	30–45	0. 63–2. 0	. 24	5. 2–5. 8	19	105	Low.
							2. 0–6. 3	. 22	5. 2–6. 4			
ML–CL	A–4		85–100	80–95	80–90	60–75	2. 0–6. 3	. 17	4. 5–5. 8	14	110	Low.
SM–SC or CL.	A–2 or A–4.		60–80	50–70	30–45	30–55	2. 0–6. 3	. 12	4. 5–5. 6	14	120	Low.
							2. 0–6. 3	. 21	5. 2–6. 0			
ML–CL	A–4 or A–6.		95–100	90–100	85–95	65–85	0. 63–2. 0	. 13	5. 2–6. 6	15	110	Moderate.
ML–CL	A–4		85–100	80–100	65–85	55–75	2. 0–6. 3	. 11	5. 2–6. 6	15	120	Low.
							2. 0–6. 3	. 21				
CL–ML	A–4		80–95	75–95	80–90	55–75	0. 63–2. 0	. 17		16	113	Moderate.
CL–ML	A–4		75–90	70–90	75–85	50–65	0. 2–0. 63	. 17		15	118	Moderate.
							2. 0–6. 3	. 20	5. 2–6. 0			
ML–CL or SM–SC.	A–4		85–100	80–95	60–80	45–65	2. 0–6. 3	. 15	5. 2–6. 0	17	105	Moderate.
GM–GC	A–2		40–60	35–55	30–60	20–35	0. 63–2. 0	. 21	5. 2–6. 0	17	105	Moderate.

TABLE 5.—*Brief description of soils and*

Mapping symbol	Soils	Depth to seasonally high water table	Depth to bedrock	Brief description of soil and site	Depth from surface (typical profile)
		Feet	*Feet*		*Inches*
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded.				
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded.				
RhA	Rohrersville silt loam, 0 to 3 percent slopes.	0	5–50+	Soils in depressions and along drainageways of uplands; 3 to 5 feet of poorly drained silt loam or gravelly silt loam formed in alluvium and colluvium washed from areas of Highfield and Myersville soils.	0–7
RhB	Rohrersville silt loam, 3 to 8 percent slopes.				7–48
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes.				48–56
Ro	Rowland silt loam.	0–2	5–12	Soil on flood plains; 3 feet or more of moderately well drained silt loam formed in material washed primarily from areas of red shale and sandstone.	0–15
					15–48
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded.	3+	1–3	Soils on uplands; 1 to 2 feet of well-drained sandy loam over sandstone or saprolyte that weathered from sandstone. Soils droughty at times.	0–7
					7–14
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded.				14–18
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded.				
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded.				
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded.				
WaA	Watchung silt loam, 0 to 3 percent slopes	0	4–12	Soils in low, level areas and along drainageways of uplands; 2½ to 4 feet of poorly drained silt loam over weathered diabase. Subsoil is fine textured and is very sticky and very plastic when wet.	0–9
WaB	Watchung silt loam, 3 to 8 percent slopes				9–30
WcA	Watchung very stony silt loam, 0 to 8 percent slopes.				30–40
Wd	Wehadkee silt loam.	0	4–15	Soils on flood plains; 3 feet or more of poorly drained silt loam that formed in material washed mostly from weathered granite, gneiss, schist, diabase, and quartzite. Subsoil is very plastic silty clay.	0–5
					5–37
WoA	Worsham silt loam, 0 to 3 percent slopes	0	4–12	Soils in depressions and along drainageways of uplands; more than 3 feet of poorly drained silt loam over phyllite, schist, and gneiss. Subsoil is fine textured and is sticky and plastic when wet.	0–9
WoB	Worsham silt loam, 3 to 8 percent slopes				9–20
					20–37

their estimated properties—Continued

Classification		Coarse fraction greater than 3 inches	Percentage passing sieve—				Range in permeability	Available moisture capacity	Reaction	Optimum moisture	Maximum dry density	Shrink-swell potential
Unified	AASHO		No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)						
		Percent					*Inches per hour*	*Inches per in.*	*pH*	*Percent*	*Pounds per cubic foot*	
							0.63–2.0	0.19	5.2–5.8			
ML–CL	A–4		90–100	85–100	70–90	60–80	0.2–0.63	.17	5.2–5.8	16	105	Moderate.
SM or ML	A–4		85–95	75–85	60–80	45–55	0.63–2.0	.16	5.2–5.8	13	110	Low.
							2.0–6.3	.18	5.2–6.0			
ML–CL or SM.	A–4 or A–6.		95–100	90–100	75–95	45–75	0.63–2.0	.17	5.2–6.0	15	105	Moderate.
							2.0–6.3	.16	4.8–5.8			
ML–CL	A–4		90–100	90–100	65–85	65–75	2.0–6.3	.15	4.8–5.8	14	113	Low.
SM or ML	A–4		80–100	80–100	50–70	40–60	2.0–6.3	.16	4.8–5.8	14	111	Low.
							<0.2	.20	5.5–7.0			
CH	A–7		95–100	90–100	85–95	80–95	<0.2	.11	5.5–7.0	21	100	High.
ML–CL	A–6		95–100	90–100	70–90	55–70	<0.2	.10	5.5–7.0	16	110	High.
							<0.2	.16	5.5–6.8			
CH	A–7		95–100	90–100	85–95	80–95	<0.2	.11	5.5–6.8	20	100	High.
							<0.2	.20	5.2–6.0			
CL or ML	A–4		95–100	90–100	85–95	55–70	<0.2	.13	5.2–6.0	15	105	Moderate.
CH or MH	A–7		95–100	90–100	75–95	70–80	<0.2	.14	5.2–6.0	20	100	High.

TABLE 6.—*Engineering*

[Absence of data indicate that there are no soil

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability for—			Soil features adversely affecting—
			Topsoil	Road subgrade	Road fill	Highway location
Abbottstown silt loam (AbA, AbA2, AbB2)	Fair	Moderate	Fair	Poor to fair	Fair	Seasonally high water table.
Arendtsville gravelly loam (AgA, AgB2, AgC2, AgC3, AgD, AgD3, AgE, AgE3, AgF2).	Good	Low	Good	Fair	Fair	
Athol gravelly silt loam (AtA2, AtB2, AtC2)	Good	Low	Good	Fair	Fair	Scattered rock ledges.
Bermudian silt loam (Be)	Fair	Moderate	Good	Fair	Fair	Occasional flooding.
Birdsboro silt loam (BmA, BmB2, BmC2)	Fair	Low	Good	Fair	Fair	
Bowmansville silt loam (Bn, BoA, BoB)	Poor	High	Fair	Poor	Fair	Flooding; high water table.
Brecknock silt loam (BrA2, BrB2, BrB3, BrC2, BrC3, BrD2, BrD3, BrE).	Fair	Low	Fair	Fair	Fair to good.	Some steep slopes; bedrock near surface.
Buchanan gravelly silt loam (BuA, BuB)	Fair	Moderate	Fair	Fair to good.	Fair	Seasonally high water table.
Buchanan very stony silt loam (BvC)	Fair	Moderate	Poor	Fair to good.	Fair	Seasonally high water table.
Catoctin channery silt loam (CcB2, CcC2, CcC3, CcD2, CcD3, CcE3).	Good	Low	Fair to good.	Good	Good	Shallowness to bedrock.
Catoctin very stony loam (in HhB, HhD, HhE).	Good	Low	Poor	Fair to good.	Good	Stoniness
Chewacla silt loam (Ck)	Fair	Low	Fair to good.	Fair to poor.	Fair to good.	Flooding
Conestoga silt loam (CoA2, CoB2, CoB3, CoC2, CoC3, CoD3).	Fair	Moderate	Good	Fair	Fair	
Croton silt loam (CrA, CrB2)	Poor	High	Fair to poor.	Poor	Fair	High water table
Dunning silty clay loam (Du)	Very poor	High	Poor	Poor	Poor	Flooding; high water table.
Edgemont channery loam (EcB, EcC, EcD2)	Good	Low	Fair	Good	Good	Some moderately steep slopes.
Edgemont very stony loam (EhB, EhD, EhE)	Good	Low	Fair to poor.	Good	Good	Some steep, stony slopes.
Glenelg silt loam (GcA, GcB2, GcC, GcC2)	Good	Low	Fair to good.	Good	Fair	Variable depth to bedrock.
Glenville silt loam (GnA, GnB)	Fair	Moderate	Fair to good.	Fair to poor.	Poor	Seasonally high water table.
Guthrie silt loam (Gu)	Very poor	High	Poor	Poor to fair.	Poor	High water table
Highfield channery silt loam (HcA2, HcB2, HcC2, HcC3, HcD, HcD3).	Good	Low	Fair to good.	Fair to good.	Good	
Highfield very stony loam (in HhB, HhD, HhE).	Good	Low	Poor	Fair to good.	Good	Stoniness
Hollinger silt loam (HoB2, HoC3, HoD3)	Fair	Low	Fair to good.	Fair	Fair	Shallowness to bedrock.
Klinesville shaly silt loam (KsA2, KsB2, KsB3, KsC2, KsC3, KsD3, KsE3).	Good	Low	Poor	Good	Good	Shallowness to hard shale.

interpretations of the soils

features that adversely affect suitability for stated use]

Soil features adversely affecting—Continued						
Construction and maintenance of pipelines	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
Seasonally high water table.			Fragipan	Slow permeability		
	Rapid permeability.		Not needed	Moderately rapid permeability.		
Scattered rock ledges.	Moderate permeability.		Not needed	Moderate permeability.		
Occasional flooding.	Rapid permeability.		Occasional flooding.	Occasional flooding.	Occasional flooding.	Occasional flooding.
	Rapid permeability; gravel pockets.		Not needed	Moderate permeability.		
Flooding; high water table.		Flooding	Flooding	Flooding; slow permeability.	High water table.	Flooding.
Shallowness to bedrock.	Shallowness in some areas.		Not needed	Moderate permeability; shallowness in some areas.	Shallowness in some areas.	
Moderately slow permeability; seasonally high water table.	Moderately slow permeability.		Fragipan	Moderately slow permeability.		
Stoniness; moderately slow permeability; seasonally high water table.	Stoniness	Stoniness	Stoniness; fragipan.	Moderately slow permeability; stoniness.	Stoniness	Stoniness.
Shallowness	Shallowness	Moderate permeability.	Not needed	Shallowness; moderately rapid permeability.	Shallowness; boulders in some areas.	Shallowness to bedrock.
Stoniness	Stoniness	Stoniness	Stoniness	Shallowness in some areas.	Stoniness	Stoniness.
Flooding; seasonally high water table.	Flooding; rapid permeability.	Flooding	Flooding	Flooding; moderately rapid permeability.	Seasonally high water table.	
	Cavernous bedrock in some areas.		Not needed	Moderately rapid permeability.		
High water table			Lack of outlets; fragipan.	High water table; slow permeability.	Lack of outlets	Lack of outlets.
Flooding; high water table.	Flooding	Flooding	Lack of outlets; flooding.	Flooding; slow permeability.	Lack of outlets	Lack of outlets.
Moderate depth to bedrock.	Rapid permeability in subsoil.	Subject to piping.	Not needed	Moderately rapid permeability.		
Steepness; stoniness.	Rapid permeability in subsoil; stoniness.	Very stony	Not needed	Steep; very stony	Stoniness	Stoniness.
Variable depth to bedrock.	Rapid permeability.	Compacting difficult.	Not needed	Moderately rapid permeability.		
Seasonally high water table.			Seasonally high water table.	Moderately slow permeability.		
Fluctuating high water table.		Low strength	Lack of outlets	Slow permeability	Lack of outlets	Lack of outlets.
Moderate depth to rock in some places.	Rapid permeability.		Not needed	Moderately rapid permeability.		
Stoniness	Stoniness	Stoniness	Stoniness	Shallowness in some areas.	Stoniness	Stoniness.
Shallowness	Shallowness	Shallowness to rock.	Not needed	Shallowness	Shallowness	
Shallowness	Permeability; bedrock.	Rapid permeability.	Not needed	Moderately rapid permeability.	Shallowness	

TABLE 6.—*Engineering interpre-*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability for—			Soil features adversely affecting—
			Topsoil	Road subgrade	Road fill	Highway location
Lamington silt loam (La)	Fair	Moderate	Poor to fair.	Fair to poor.	Fair	High water table
Lansdale loam (LdA2, LdB2, LdB3, LdC2, LdC3).	Good	Low	Fair	Fair to poor.	Good	
Lawrence silt loam (Le)	Poor	High	Fair	Poor	Poor	Seasonally high water table.
Legore channery silt loam (LgB2, LgC2, LgC3, LgD3, LgE3).	Good	Moderate	Fair	Fair	Fair	Shallowness
Lehigh silt loam (LhA, LhB2)	Fair	Moderate	Fair.	Fair to poor.	Fair	Seasonally high water table.
Lehigh silt loam, thin solum variant (LtB3, LtC3).	Fair	Moderate	Poor	Fair to poor.	Fair	Shallowness; seasonally high water table.
Lehigh very stony silt loam (LvB)	Fair	Moderate	Poor	Fair to poor.	Fair	Seasonally high water table.
Lindside silt loam (in Me)	Fair	Moderate	Good	Poor	Fair	Flooding; seasonally high water table.
Manor loam (MaB2, MaC2, MaC3, MaD3)	Good	Low	Fair	Fair	Fair	Shallowness to bedrock.
Melvin silt loam (in Me)	Poor	High	Fair	Poor	Fair to poor.	Flooding; high water table.
Montalto silt loam (MoA, MoB2, MoC2)	Good	Moderate	Good	Poor	Fair	
Montalto very stony silt loam (MsB, MsD, MsE).	Good	Moderate	Fair to good.	Poor	Fair	Stoniness
Mount Lucas silt loam (MtA2, MtB2, MtC2, MuA, MuB).	Fair	Moderate	Fair	Fair	Fair	Seasonally high water table.
Myersville silt loam (MvA2, MvB2, MvC2, MvC3, MvD, MvD3).	Good	Low	Fair to good.	Fair	Fair	Moderate depth to bedrock in some places.
Penn silt loam (PeA2, PeB2, PeB3, PeC2, PeC3, PeD2).	Good	Low	Fair	Fair	Good	Variable; shallowness to bedrock.
Readington silt loam (RaA, RaB2, and in RdA, RdB2).	Fair	Moderate	Fair to good.	Poor to fair.	Fair	Seasonally high water table.
Reaville shaly silt loam (ReA2, ReB2, ReB3, ReC3).	Poor	Moderate	Fair to poor.	Fair	Fair	Shallowness; seasonally high water table.
Rohrersville silt loam (RhA, RhB)	Poor	Moderate	Fair to poor.	Poor to fair	Fair	Seasonally high water table.
Rohrersville very stony silt loam (RmB)	Poor	Moderate	Poor	Poor to fair	Fair	Seasonally high water table.
Rowland silt loam (Ro)	Poor	High	Good	Fair	Fair	Flooding
Steinsburg sandy loam (SsB2, SsB3, SsC2, SsC3, SsD3).	Good	Low	Poor	Fair to good.	Fair	Shallowness to bedrock.
Watchung silt loam (WaA, WaB)	Poor	High	Poor	Poor	Poor	High water table
Watchung very stony silt loam (WcA)	Poor	High	Poor	Poor	Poor	High water table
Wehadkee silt loam (Wd)	Poor	High	Fair to poor.	Poor	Poor	Flooding
Wiltshire silt loam (in RdA, RdB2)	Fair	Moderate	Good	Poor	Poor	Seasonally high water table.
Worsham silt loam (WoA, WoB)	Poor	High	Poor	Poor	Poor	High water table

tations of the soils—Continued

Soil features adversely affecting—Continued						
Construction and maintenance of pipelines	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
	Reservoir area	Embankment				
High water table			High water table.	Moderate permeability; high water table.	Not needed	High water table.
	Rapid permeability.		Not needed	Moderately rapid permeability.		
Seasonally high water table.	Cavernous bedrock in some areas.	Low strength	Seasonally high water table; fragipan.	Moderately slow permeability.		
Shallowness	Rapid permeability.	Shallowness		Shallowness	Shallowness	
Seasonally high water table.			Seasonally high water table.	Siltpan		
Shallow; seasonnally high water table.	Shallowness	Shallowness	Siltpan	Siltpan	Shallowness	Shallowness.
Stoniness	Stoniness	Stoniness	Stoniness	Siltpan	Stoniness	Stoniness.
Flooding; seasonsonally high water table.	Flooding		Flooding	Flooding; moderately slow permeability.		
Shallowness	Rapid permeability.	Rapid permeability.	Not needed	Rapid permeability.	Shallowness	
High water table	Flooding	Flooding	Very slow permeability.	Flooding	Not needed	Flooding.
Boulders in some places.			Not needed	Moderate permeability.		
Stoniness	Stoniness	Stoniness	Not needed	Stoniness; steepness.	Stoniness	Stoniness.
Seasonally high water table.	Stoniness in some areas.	Stoniness in some areas.	Stoniness in some areas.	Moderate permeability.		
Moderate depth to bedrock in some places.	Moderate permeability.		Not needed	Moderate permeability.		
Shallowness to rock.	Moderately rapid permeability.		Not needed	Moderately rapid permeability.		Shallowness.
Seasonally high water table.	Permeability in substrata in some places.		Fragipan	Seasonally high water table; moderate permeability.		
Shallowness	Shallowness		Shallowness	Shallowness	Shallowness	
Seasonally high water table.			Moderately slow permeability.	Moderately slow permeability.		Seasonally high water table.
Seasonally high water table.	Stoniness	Stoniness	Stoniness	Stoniness	Stoniness	Stoniness.
Flooding; high water table.			Flooding; high water table.	Flooding; high water table.	Not needed	Flooding.
Shallowness to bedrock.	Rapid permeability.	Shallowness	Not needed	Rapid permeability.	Shallowness	Shallowness.
High water table		Low strength	Slow permeability.	Slow permeability.		High water table.
High water table	Stoniness	Stoniness	Stoniness; slow permeability.	Slow permeability	Stoniness	Stoniness.
Flooding	Flooding	Flooding; low strength.	Flooding	Flooding; slow permeability.		Flooding.
Seasonally high water table.	Cavernous substrata in some places.		Moderately slow permeability.	Moderately slow permeability.		Seasonally high water table.
High water table			Slow permeability.	Slow permeability		High water table.

Table 6, beginning on page 58, rates the soils in the county according to their suitability for winter grading, their susceptibility to frost action, and their suitability as topsoil, road subgrade, and road fill. It also lists undesirable features of the soils that affect several named engineering practices and structures, and that, therefore, must be considered in planning, design, construction, and maintenance.

Soils and Rural Developments

Adams County, especially in the northern and eastern parts, is increasing in population. If the present trend continues or intensifies, many farming areas of the county will be transformed into residential developments. This soil survey will help in planning these developments and in solving problems that arise as the use of the land changes. Planning officials and developers, as well as homeowners, can find useful information on the soil maps, in the text, and in the tables of this report. Table 6 in the subsection "Engineering Uses of the Soils" gives information on the features of the soils in each series that affect construction of ponds, laying of pipelines, location of roads, and other uses. In table 5 properties important in engineering are estimated.

In table 7 the limitations of the soils in the county for specified rural uses are rated slight, moderate, or severe. If the limitations for a specified use are rated moderate or severe, the chief limitation for the use specified is listed. Table 7, the soil map, and the text of this subsection are guides and will eliminate some soils from further consideration as sites for rural development, but for other soils an investigation on the site of a planned development is needed. In rating the limitations, only features of soils were considered. Location in relation to established centers or transportation lines and other economic factors are important and will affect the selection of a site.

In the following pages the soils of the county are placed in 13 building site groups on the basis of soil features that affect their use for building sites and for other rural development. These features are depth of the soil, degree of slope, internal drainage, hazard of flooding, kind of parent material, and stoniness. For each building site group, the soils are briefly described and are listed. Then their use for rural development is discussed, especially their use as disposal fields for septic tanks and as foundations for buildings of not more than three stories. The limitations for other specified uses are given in table 7.

BUILDING SITE GROUP 1

This group consists mainly of deep, well-drained, permeable soils on slopes that range from 0 to 8 percent. Some areas of Highfield soils and Myersville soils are moderately deep. The soils in this group are—

Arendtsville gravelly loam, 0 to 3 percent slopes.
Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded.
Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded.
Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded.
Birdsboro silt loam, 0 to 3 percent slopes.
Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded.
Conestoga silt loam, 0 to 3 percent slopes, moderately eroded.
Conestoga silt loam, 3 to 8 percent slopes, moderately eroded.
Conestoga silt loam, 3 to 8 percent slopes, severely eroded.
Edgemont channery loam, 3 to 8 percent slopes.
Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded.
Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded.
Myersville silt loam, 0 to 3 percent slopes, moderately eroded.
Myersville silt loam, 3 to 8 percent slopes, moderately eroded.

Generally, the soils in this group are better suited, and have fewer limitations as sites for houses and other buildings, than the soils of any other building site group in the county. Some of the soils, however, are among the best in the county for farming and probably should be used to produce special crops.

Because slopes are not steep and grading is easy, the soils in this group are desirable for most residential and rural construction. Except for the Athol soils and some areas of the Conestoga soils, the soils make good foundations for buildings. The Athol and Conestoga soils should be examined carefully before construction is planned because cracks or caverns in the bedrock may cause foundations to fail. Some areas of the Conestoga soils are cavernous because limestone has been taken away in solution. Most of the soils in this group permit the infiltration of sewage effluent at a moderate rate that is adequate for the operation of septic tanks, but disposal fields may pollute the ground water in some areas of the Athol and Conestoga soils where there are cracks and caverns in the bedrock.

BUILDING SITE GROUP 2

This group consists mainly of deep, well-drained, permeable soils on slopes that range from 8 to 25 percent. Some areas of Highfield soils and Myersville soils are moderately deep. The soils in this group are—

Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded.
Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded.
Arendtsville gravelly loam, 15 to 25 percent slopes.
Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded.
Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded.
Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded.
Conestoga silt loam, 8 to 15 percent slopes, moderately eroded.
Conestoga silt loam, 8 to 15 percent slopes, severely eroded.
Conestoga silt loam, 15 to 25 percent slopes, severely eroded.
Edgemont channery loam, 8 to 15 percent slopes.
Edgemont channery loam, 15 to 25 percent slopes, moderately eroded.
Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded.
Highfield channery silt loam, 8 to 15 percent slopes, severely eroded.
Highfield channery silt loam, 15 to 25 percent slopes.
Highfield channery silt loam, 15 to 25 percent slopes, severely eroded.
Myersville silt loam, 8 to 15 percent slopes, moderately eroded.
Myersville silt loam, 8 to 15 percent slopes, severely eroded.
Myersville silt loam, 15 to 25 percent slopes.
Myersville silt loam, 15 to 25 percent slopes, severely eroded.

Because of their slopes, these soils are limited in their use for most residential development, and erosion, including gully erosion, may be a problem because runoff is rapid. Except on the steeper slopes where soil creep may occur, sites for building foundations are generally good. The water table is not high. Normal loads of effluent from septic tanks can be disposed of satisfactorily in most of these soils, but in some areas of the Athol and Conestoga soils the waste may sink into large channels in the bedrock and contaminate the ground water.

BUILDING SITE GROUP 3

This group consists of deep, well-drained, moderately permeable soils on slopes that range from 0 to 8 percent. The soils are—

Montalto silt loam, 0 to 3 percent slopes.
Montalto silt loam, 3 to 8 percent slopes, moderately eroded.
Montalto very stony silt loam, 0 to 8 percent slopes.

Except for the very stony soil, the soils in this group are suited to special crops. Consequently, retaining areas for farming should be considered.

The slopes of these soils present few limitations for most kinds of residential and other rural construction. Also, the soils make good foundations for buildings, but the many boulders in the very stony soil add to the cost of excavation and grading. The water table is not seasonally high. These soils are permeable enough to have good drainage and aeration, but permeability is not so rapid as that of the soils in building site groups 1 and 2, and the rate of disposal for effluent from septic tanks is much slower.

BUILDING SITE GROUP 4

This group consists of deep, well-drained, moderately slowly permeable soils on slopes that range from 8 to 25 percent. These soils are—

Montalto silt loam, 8 to 15 percent slopes, moderately eroded.
Montalto very stony silt loam, 8 to 25 percent slopes.

The slopes of these soils present moderate limitations for most residential construction. These soils make good foundations for buildings except in the steeper areas where soil creep may occur. The very stony soil is difficult and expensive to excavate because of the boulders on and in the soil. During and following construction on the soils in this group, runoff may wash away soil material and also flood the unprotected lower areas and deposit silt. The water table is not seasonally high, and internal drainage and aeration are good. Because permeability is only moderately slow, the rate of disposal for effluent from septic tanks is less than that on the soils in building site groups 1 and 2. Larger areas are needed for disposal fields.

BUILDING SITE GROUP 5

This group consists of deep and moderately deep, well-drained, permeable soils on slopes that range from 0 to 8 percent. These soils are—

Brecknock silt loam, 0 to 3 percent slopes, moderately eroded.
Brecknock silt loam, 3 to 8 percent slopes, moderately eroded.
Brecknock silt loam, 3 to 8 percent slopes, severely eroded.
Edgemont very stony loam, 0 to 8 percent slopes.
Glenelg silt loam, 0 to 3 percent slopes.
Glenelg silt loam, 3 to 8 percent slopes, moderately eroded.
Highfield and Catoctin very stony loams, 0 to 8 percent slopes.
Lansdale loam, 0 to 3 percent slopes, moderately eroded.
Lansdale loam, 3 to 8 percent slopes, moderately eroded.
Lansdale loam, 3 to 8 percent slopes, severely eroded.
Manor loam, 3 to 8 percent slopes, moderately eroded.
Penn silt loam, 0 to 3 percent slopes, moderately eroded.
Penn silt loam, 3 to 8 percent slopes, moderately eroded.
Penn silt loam, 3 to 8 percent slopes, severely eroded.

The slopes of these soils present slight limitations for most residential and other rural construction. Suitability for foundations varies, but in most places it is good. In many places excavations reach rock of varying hardness, for depth to bedrock is generally only 2 to 4 feet, and the upper part of the rock is partly weathered and soft. In many areas of Glenelg and Manor soils, rotten rock, or saprolite, that cannot support a heavy weight, extends to a depth of 20 feet. The very stony soils in this group contain enough boulders to add to the cost of excavation and grading. Areas used for sanitary fill are subject to settling. Although these soils are well drained and permeable, and the infiltration of effluent from septic tanks is satisfactory in most places, the bedrock is at a depth of less than 3 feet in some places and limits use as disposal fields for septic tanks. Except for the very stony soils, the soils in this group are fairly good for farming.

BUILDING SITE GROUP 6

This group consists mainly of moderately deep, well-drained, permeable soils on slopes that range from 8 to 25 percent, but some of the soils are deep and very stony. The soils in this group are—

Brecknock silt loam, 8 to 15 percent slopes, moderately eroded.
Brecknock silt loam, 8 to 15 percent slopes, severely eroded.
Brecknock silt loam, 15 to 25 percent slopes, moderately eroded.
Brecknock silt loam, 15 to 25 percent slopes, severely eroded.
Edgemont very stony loam, 8 to 25 percent slopes.
Glenelg silt loam, 8 to 15 percent slopes.
Glenelg silt loam, 8 to 15 percent slopes, moderately eroded.
Highfield and Catoctin very stony loams, 8 to 25 percent slopes.
Lansdale loam, 8 to 15 percent slopes, moderately eroded.
Lansdale loam, 8 to 15 percent slopes, severely eroded.
Manor loam, 8 to 15 percent slopes, moderately eroded.
Manor loam, 8 to 15 percent slopes, severely eroded.
Manor loam, 15 to 25 percent slopes, severely eroded.
Penn silt loam, 8 to 15 percent slopes, moderately eroded.
Penn silt loam, 8 to 15 percent slopes, severely eroded.
Penn silt loam, 15 to 25 percent slopes, moderately eroded.

These soils have slopes that only moderately limit their use for most residential construction, but they are too steep for most commercial or light industrial structures. Sites are fairly good for the foundations of small structures. In many places the Manor and Glenelg soils are underlain by partly weathered rock, or saprolite, that is generally soft and elastic. The very stony soils contain enough boulders to make grading and excavating difficult and expensive. Soil creep may occur on the stronger slopes. During and after rural building, runoff is a problem and may cause severe gullying. The water table is not seasonally high, and internal drainage and aeration are good. Bedrock near the surface and the slopes limit the use of these soils as disposal fields for septic tanks.

BUILDING SITE GROUP 7

This group consists mainly of shallow, well-drained soils on slopes that range from 0 to 8 percent. Some areas of the Legore and Steinsburg soils are moderately deep. The soils in this group are—

Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded.
Hollinger silt loam, 3 to 8 percent slopes, moderately eroded.
Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded.
Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded.
Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded.
Legore channery silt loam, 3 to 8 percent slopes, moderately eroded.
Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded.
Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
AbA AbA2	Abbottstown silt loam, 0 to 3 percent slopes. Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: seasonally high water table.	Slight	Severe: seasonally high water table.
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: seasonally high water table.	Moderate: slope	Severe: seasonally high water table.
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes.	Slight	Severe: moderately rapid permeability.	Slight
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded.	Slight	Severe: moderately rapid permeability.	Slight
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded.	Moderate: slope	Severe: slope	Moderate: slope
AgD AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes. Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: slope
AgE AgE3 AgF2	Arendtsville gravelly loam, 25 to 35 percent slopes. Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded. Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded.	Severe: slope	Severe: slope	Severe: slope
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded.	Slight: possible ground-water contamination.	Severe: moderate permeability.	Slight
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded.	Slight: possible ground-water contamination.	Severe: moderate permeability.	Slight
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
Be	Bermudian silt loam.	Severe: flooding	Severe: flooding	Severe: flooding
BmA	Birdsboro silt loam, 0 to 3 percent slopes.	Slight	Severe: moderately rapid permeability.	Slight
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded.	Slight	Severe: moderately rapid permeability.	Slight
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
Bn BoA BoB	Bowmansville silt loam. Bowmansville silt loam, local alluvium, 0 to 3 percent slopes. Bowmansville silt loam, local alluvium, 3 to 8 percent slopes.	Severe: flooding	Severe: flooding	Severe: flooding
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Moderate: shallow to bedrock.
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Moderate: shallow to bedrock.
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Moderate: shallow to bedrock.
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: slope	Moderate: shallow to bedrock.

specified uses in rural development

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.
Slight	Slight	Moderate: gravelly surface layer.	Slight	Slight	Slight.
Slight	Moderate: slope	Moderate: gravelly surface layer.	Slight	Slight	Slight.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: slope; erosion.	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: slope; erosion.	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Slight	Moderate: gravelly surface.	Slight	Slight: scattered rock.	Slight: scattered rock.
Slight	Moderate: slope	Moderate: gravelly surface.	Slight	Slight: scattered rock.	Slight: scattered rock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight: scattered rock.	Moderate: slope.
Moderate: flooding	Moderate: flooding	Moderate: flooding	Slight	Severe: flooding	Severe: flooding.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Slight.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Moderate: shallow to bedrock.	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Moderate: shallow to bedrock.	Moderate: slope	Moderate: slope	Moderate: shallow to bedrock.	Severe: shallow to to bedrock.	Severe: shallow to bedrock.
Moderate: shallow to bedrock.	Severe: slope; shallow to bedrock.	Moderate: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: slope	Moderate: shallow to bedrock.
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded.	Severe: slope	Severe: slope	Moderate: shallow to bedrock.
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: shallow to bedrock.
BrE	Brecknock silt loam, 25 to 50 percent slopes.	Severe: slope	Severe: slope	Severe: slope
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes.	Severe: moderately slow permeability.	Slight	Moderate: seasonally high water table.
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes.	Severe: seasonally high water table.	Moderate: slope	Moderate: seasonally high water table.
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes.	Severe: seasonally high water table.	Severe: slope	Moderate: seasonally high water table.
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: shallow to bedrock.
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope; shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: shallow to bedrock.
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded.			
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded.	Severe: slope	Severe: slope	Moderate: slope
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded.			
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded.	Severe: slope	Severe: slope	Severe: slope
Ck	Chewacla silt loam.	Severe: flooding	Severe: flooding	Severe: flooding
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded.	Slight: possible ground-water contamination.	Moderate: moderate permeability.	Slight
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded.	Slight: possible ground-water contamination.	Moderate: moderate permeability.	Slight
CoB3	Conestoga silt loam, 3 to 8 percent slopes, severely eroded.	Slight: possible ground-water contamination.	Moderate: moderate permeability.	Slight
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope; possible ground-water contamination.	Severe: slope	Moderate: slope
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded.	Moderate: slope; possible ground-water contamination.	Severe: slope	Moderate: slope

specified uses in rural development—Continued

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock.	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock.	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Moderate: seasonally high water table.	Moderate: moderately slow permeability.	Slight	Moderate: moderately slow permeability.	Severe: moderately slow permeability.
Slight: seasonally high water table.	Moderate: slope	Moderate: slope	Slight	Moderate: seasonally high water table.	Severe: seasonally high water table.
Moderate: stony	Severe: slope	Severe: slope	Moderate: stony; slope.	Severe: stony	Severe: seasonally high water table; stony.
Slight	Moderate: slope	Moderate: slope; channery surface layer.	Slight	Slight	Severe: shallow to bedrock.
Slight	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate: flooding	Moderate: flooding	Moderate: flooding; seasonally high water table.	Slight	Severe: flooding	Severe: flooding.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Slight.
Moderate: lack of surface soil.	Moderate: slope	Moderate: slope	Slight	Slight	Slight.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: slope; erosion.	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: slope
CrA	Croton silt loam, 0 to 3 percent slopes.	Severe: high water table.	Moderate: shallow to bedrock; slope.	Severe: high water table.
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded.			
Du	Dunning silty clay loam.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.
EcB	Edgemont channery loam, 3 to 8 percent slopes.	Moderate: variable depth to rock.	Severe: moderately rapid permeability.	Slight
EcC	Edgemont channery loam, 8 to 15 percent slopes.	Moderate: slope	Severe: slope	Moderate: slope
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded.	Severe: slope	Severe: slope	Moderate: slope
EhB	Edgemont very stony loam, 0 to 8 percent slopes.	Moderate: variable depth to rock.	Severe: moderately rapid permeability.	Moderate: slope
EhD	Edgemont very stony loam, 8 to 25 percent slopes.	Moderate or severe: slope.	Severe: slope	Moderate: slope
EhE	Edgemont very stony loam, 25 to 70 percent slopes.	Severe: slope	Severe: slope	Severe: slope
GcA	Glenelg silt loam, 0 to 3 percent slopes.	Slight or moderate: variable depth to bedrock.	Severe: moderately rapid permeability.	Slight or moderate: variable depth to bedrock.
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded.	Slight or moderate: variable depth to bedrock.	Severe: moderately rapid permeability.	Slight or moderate: variable depth to bedrock.
GcC GcC2	Glenelg silt loam, 8 to 15 percent slopes. Glenelg silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
GnA	Glenville silt loam, 0 to 3 percent slopes.	Severe: seasonally high water table.	Slight	Moderate: seasonally high water table.
GnB	Glenville silt loam, 3 to 8 percent slopes.	Severe: seasonally high water table.	Moderate: slope	Moderate: seasonally high water table.
Gu	Guthrie silt loam.	Severe: high water table.	Slight	Severe: high water table.
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded.	Slight or moderate: variable depth to rock.	Severe: moderately rapid permeability.	Slight
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded.	Slight or moderate: variable depth to rock.	Severe: moderately rapid permeability.	Moderate: moderately deep to rock.
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded.	Moderate: slope	Severe: slope	Moderate: slope
HcD HcD3	Highfield channery silt loam, 15 to 25 percent slopes. Highfield channery silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: slope

specified uses in rural development—Continued

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.	Severe: high water table; flooding.
Slight	Moderate: slope	Moderate: slope	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: stony	Moderate: slope	Severe: stony	Slight	Moderate: stony	Severe: stony.
Severe: stony	Severe: slope	Severe: slope	Moderate: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Slight	Slight	Slight	Slight	Slight or moderate: variable depth to bedrock.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Slight or moderate: variable depth to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight	Slight or moderate: variable depth to bedrock.
Slight	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Slight	Moderate: seasonally high water table.	Severe: seasonally high water table.
Slight	Moderate: slope	Moderate: slope	Slight	Moderate: seasonally high water table.	Severe: seasonally high water table.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Slight	Slight	Moderate: channery surface layer.	Slight	Slight	Slight.
Slight	Moderate: slope	Moderate: slope	Slight	Slight	Slight.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: slope; lack of topsoil.	Severe: slope	Severe: slope	Moderate: slope	Slight	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes.	Moderate: shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: stony
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes.	Moderate or severe: shallow; slope.	Severe: slope	Moderate: stony
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes.	Severe: slope	Severe: slope	Severe: slope
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: moderately rapid permeability; shallow.	Severe: shallow to bedrock.
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded.			
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded.			
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Severe: shallow to bedrock.
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded.			
La	Lamington silt loam.	Severe: high water table.	Slight	Severe: high water table.
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: shallow to bedrock.
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: shallow to bedrock.
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded.			
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded.	Moderate: shallow; slope.	Severe: slope	Moderate: shallow to bedrock.
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded.			
Le	Lawrence silt loam.	Severe: seasonally high water table.	Slight	Severe: seasonally high water table.
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to rock.	Severe: moderate permeability; shallow to rock.	Severe: shallow to rock.
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: shallow to rock.	Severe: slope	Severe: shallow to bedrock.
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded.			
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded.			

specified uses in rural development—Continued

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Severe: stony	Moderate: slope	Severe: stony	Slight	Severe: stony; shallow to bedrock.	Severe: stony; shallow to bedrock.
Moderate: stony	Severe: slope	Severe: slope	Moderate: slope	Severe: stony; shallow.	Severe: stony; shallow.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: shallow to bedrock.	Moderate: slope	Moderate: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Moderate: shallow to rock.	Severe: shallow to rock.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: shallow to bedrock; slope.	Severe: slope	Moderate: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Moderate: shallow to bedrock.	Slight	Slight	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: shallow to bedrock.	Moderate: slope	Moderate: slope	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.
Severe: shallow to rock.	Moderate: slope	Moderate: slope; channery surface layer.	Slight	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
LhA	Lehigh silt loam, 0 to 3 percent slopes.	Severe: seasonally high water table; shallow.	Slight	Severe: seasonally high water table.
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: seasonally high water table.	Moderate: slope	Severe: seasonally high water table.
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded.	Severe: shallow; seasonally high water table.	Moderate: slope; shallow.	Severe: shallow; seasonally high water table.
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded.	Severe: shallow; seasonally high water table.	Severe: slope	Severe: shallow; seasonally high water table.
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes.			
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderately rapid permeability.	Moderate: shallow; instability.
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: shallow; instability.
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded.	Moderate: slope	Severe: slope	Moderate: shallow; instability.
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: shallow; instability.
Me	Melvin and Lindside silt loams:			
	Lindside soil	Severe: flooding	Severe: flooding	Severe: flooding
	Melvin soil	Severe: flooding	Severe: flooding	Severe: flooding
MoA	Montalto silt loam, 0 to 3 percent slopes.	Severe: moderately slow permeability.	Moderate: variable depth to rock.	Slight
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: moderately slow permeability.	Moderate: slope	Slight
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: moderately slow permeability.	Severe: slope	Moderate: slope
MsB	Montalto very stony silt loam, 0 to 8 percent slopes.	Severe: moderately slow permeability.	Moderate: variable depth to rock.	Moderate: stony
MsD	Montalto very stony silt loam, 8 to 25 percent slopes.	Severe: slopes	Severe: stony; slopes	Severe: stony; slopes
MsE	Montalto very stony silt loam, 25 to 50 percent slopes.			
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: seasonally high water table.	Slight	Moderate: seasonally high water table.
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: seasonally high water table.	Moderate: slope	Moderate: seasonally high water table.
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: seasonally high water table.	Severe: slope	Moderate: seasonally high water table.
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes.	Severe: seasonally high water table.	Slight	Severe: high water table.

specified uses in rural development—Continued

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.
Severe: shallow; seasonally high water table.	Moderate: seasonally high water table; slope.	Severe: shallow; seasonally high water table.	Moderate: shallow; seasonally high water table.	Severe: seasonally high water table; shallow.	Severe: seasonally high water table; shallow.
Severe: shallow; seasonally high water table.	Severe: slope	Severe: shallow; seasonally high water table.	Moderate: shallow; seasonally high water table.	Severe: seasonally high water table; shallow.	Severe: seasonally high water table; shallow.
Moderate: shallow to bedrock.	Moderate: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.
Moderate: flooding Severe: flooding; high water table.	Severe: flooding Severe: flooding; high water table.	Moderate: flooding Severe: flooding; high water table.	Moderate: flooding Severe: flooding	Severe: flooding Severe: flooding; high water table.	Severe: flooding Severe: flooding; high water table.
Slight	Slight	Slight	Slight	Moderate: moderately slow permeability.	Severe: moderately slow permeability.
Slight	Moderate: slope	Moderate: slope	Slight	Moderate: moderately slow permeability.	Severe: moderately slow permeability.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: moderately slow permeability.	Severe: moderately slow permeability.
Severe: stony	Moderate: slope	Moderate: slope	Moderate: stony	Severe: stony	Severe: stony.
Severe: stony; slopes.	Severe: stony; slopes.	Severe: stony; slopes.	Severe: stony; slopes.	Severe: stony; slopes.	Severe: stony; slopes.
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Slight	Moderate: seasonally high water table.	Severe: seasonally high water table.
Moderate: seasonally high water table.	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Slight	Moderate: seasonally high water table.	Severe: seasonally high water table.
Moderate: seasonally high water table.	Severe: slope	Severe: slope	Moderate: slope	Moderate: seasonally high water table.	Severe: seasonally high water table.
Severe: high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes.	Severe: seasonally high water table.	Moderate: slope	Severe: high water table.
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderate permeability; shallow.	Moderate: shallow to bedrock.
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded.	Moderate: shallow to bedrock.	Severe: moderate permeability; shallow.	Moderate: shallow to bedrock.
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded.	Moderate: slope	Severe: slope	Moderate: slope
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded.			
MvD	Myersville silt loam, 15 to 25 percent slopes.			
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Moderate: slope
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: moderately rapid permeability.	Severe: shallow to bedrock.
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: moderately rapid permeability.	Severe: shallow to bedrock.
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: moderately rapid permeability.	Severe: shallow to bedrock.
PeC2	Penn silt loam, 8 to 15 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded.	Severe: slope	Severe: slope	Severe: shallow to bedrock.
RaA	Readington silt loam, 0 to 3 percent slopes.	Severe: seasonally high water table.	Moderate: shallow to rock; slope.	Moderate: seasonally high water table.
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded.	Severe: seasonally high water table.	Moderate: slope	Moderate: seasonally high water table.
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes:			
	Readington soil	Severe: seasonally high water table.	Slight or moderate: seasonally high water table.	Moderate: seasonally high water table.
	Wiltshire soil	Severe: seasonally high water table.	Slight (possible ground water contamination).	Moderate: seasonally high water table.
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded:			
	Readington soil	Severe: seasonally high water table.	Slight or moderate: seasonally high water table.	Moderate: seasonally high water table.
	Wiltshire soil	Severe: seasonally high water table.	Moderate (possible ground water contamination): slope.	Moderate: seasonally high water table.

specified uses in rural development—Continued

Degree and kind of limitations for—Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Severe: high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Moderate: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.
Slight	Slight	Moderate: shallow to bedrock.	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Slight	Moderate: slope	Moderate: shallow to bedrock.	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: shallow to rock.	Slight	Moderate: shallow to bedrock.	Slight	Moderate: shallow to bedrock.	Moderate: shallow to bedrock.
Moderate: shallow to bedrock.	Moderate: slope	Severe: shallow to bedrock.	Slight	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Moderate: slope	Severe: shallow to bedrock.	Slight	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Moderate: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock; slope.
Severe: slope: erosion.	Severe: slope	Severe: slope	Moderate: slope	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: shallow to bedrock; slope.	Severe: shallow to bedrock; slope.
Slight	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Slight	Severe: shallow to rock; seasonally high water table.	Severe: shallow to rock; seasonally high water table.
Slight	Moderate: seasonally high water table.	Moderate: slope	Slight	Severe: seasonally high water table.	Severe: seasonally high water table.
Slight	Moderate: seasonally high water table.	Moderate: slope	Slight	Severe: shallow to rock; seasonally high water table.	Severe: shallow to rock; seasonally high water table.
Slight	Moderate: seasonally high water table.	Moderate: seasonally high water table.	Slight	Severe: seasonally high water table.	Severe: seasonally high water table.
Slight	Moderate: seasonally high water table.	Moderate: slope	Slight	Severe: shallow to rock; seasonally high water table.	Severe: shallow to rock; seasonally high water table.
Slight	Moderate: seasonally high water table.	Moderate: slope	Slight	Severe: seasonally high water table.	Severe: seasonally high water table.

TABLE 7.—*Limitations of the soils for*

Map symbol	Soils	Degree and kind of limitations for—		
		Disposal of effluent from septic tanks	Sewage lagoons	Sites of homes of 3 stories or less
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded.	Severe: shallow; seasonally high water table.	Severe: shallow	Severe: seasonally high water table; shallow.
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded.			
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded.			
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded.			
RhA	Rohrersville silt loam, 0 to 3 percent slopes.	Severe: high water table.	Slight	Severe: high water table.
RhB	Rohrersville silt loam, 3 to 8 percent slopes.	Severe: high water table.	Moderate: slope	Severe: high water table.
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes.			
Ro	Rowland silt loam.	Severe: flooding	Severe: flooding	Severe: flooding
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: moderately rapid permeability.	Severe: shallow to bedrock.
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded.			
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded.	Severe: shallow to bedrock.	Severe: slope	Severe: shallow to bedrock.
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded.			
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded.	Severe: slope	Severe: slope	Severe: shallow to bedrock.
WaA	Watchung silt loam, 0 to 3 percent slopes.	Severe: high water table.	Slight	Severe: high water table.
WaB	Watchung silt loam, 3 to 8 percent slopes.	Severe: high water table.	Moderate: slope	Severe: high water table.
WcA	Watchung very stony silt loam, 0 to 8 percent slopes.			
Wd	Wehadkee silt loam.	Severe: flooding	Severe: flooding	Severe: flooding
WoA	Worsham silt loam, 0 to 3 percent slopes.	Severe: slow permeability.	Slight	Severe: seasonally high water table.
WoB	Worsham silt loam, 3 to 8 percent slopes.	Severe: slow permeability.	Moderate: slope	Severe: seasonally high water table.

specified uses in rural development--Continued

Degree and kind of limitations for Continued					
Landscaping and lawns at homesites	Streets and parking lots	Athletic fields	Parks and play areas	Sanitary land fill (area)	Cemeteries
Severe: seasonally high water table; shallow.	Severe: shallow; seasonally high water table.	Severe: shallow.	Severe: shallow.	Severe: shallow; seasonally high water table.	Severe: shallow; seasonally high water table.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Moderate: flooding.	Moderate: flooding.	Severe: flooding; seasonally high water table.	Moderate: flooding.	Severe: flooding.	Severe: flooding.
Severe: shallow to bedrock.	Moderate: slope.	Severe: shallow to bedrock.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope.	Severe: slope.	Moderate: shallow to bedrock.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: shallow to bedrock.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: shallow to bedrock.	Severe: shallow to bedrock.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.	Severe: flooding; high water table.
Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.
Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high water table.	Severe: seasonally high watertable.

The slopes of these soils are favorable for residential, commercial, and light industrial construction, but areas are generally too small for large developments. Generally, the bedrock is hard enough to provide a good foundation, but some removal of rock is generally necessary in excavations. After earth moving, so much broken rock generally is present, or bedrock is so near the surface, that grasses, shrubs, and trees do not grow well. Problems of landscaping and establishing lawns are increased by the droughtiness of the material left after development. Although these soils are well drained, well aerated, and permeable to a depth of 1 or 2 feet, the bedrock at this depth severely limits the use of most of these soils for septic tanks. An exception is the Legore soil, which has a moderately permeable subsoil and, in many places, several feet of disintegrated rock, or saprolite, over the bedrock. In most soils, inadequate infiltration of the effluent from septic tanks may cause contamination of the ground water.

BUILDING SITE GROUP 8

This group consists mainly of shallow and moderately deep, well-drained soils on slopes that range from 8 to 25 percent. Some areas of the Legore soils are moderately deep. The soils in this group are—

Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded.
Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded.
Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded.
Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded.
Hollinger silt loam, 8 to 15 percent slopes, severely eroded.
Hollinger silt loam, 15 to 25 percent slopes, severely eroded.
Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded.
Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded.
Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded.
Legore channery silt loam, 8 to 15 percent slopes, moderately eroded.
Legore channery silt loam, 8 to 15 percent slopes, severely eroded.
Legore channery silt loam, 15 to 25 percent slopes, severely eroded.
Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded.
Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded.
Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded.

These soils have slopes that only moderately limit their use for residential construction, but they are too steep for large commercial and light industrial structures. Bedrock is generally at a depth of 1 or 2 feet, and in most places it is hard enough to provide foundations for buildings. In most excavations the removal of some bedrock is required. Enough boulders are on and in the very stony soils to make grading expensive. Runoff and erosion are problems, and soil creep may occur on the strongest slopes. These soils are so shallow that the soil material left after grading is poor for the growth of grasses, shrubs, and trees. Seeps may occur on hillsides if these soils are used for disposing of effluent from septic tanks. Except for the Legore soils, the soils in this group are shallow to bedrock and have severe limitations for use as disposal fields for the effluent from septic tanks. The Legore soils have a moderately permeable subsoil and in many places have several feet of disintegrated rock, or saprolite, over the bedrock.

BUILDING SITE GROUP 9

This group consists of well-drained soils, most of which have slopes of more than 25 percent. The soils in this group are—

Arendtsville gravelly loam, 25 to 35 percent slopes.
Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded.
Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded.
Brecknock silt loam, 25 to 50 percent slopes.
Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded.
Edgemont very stony loam, 25 to 70 percent slopes.
Highfield and Catoctin very stony loams, 25 to 70 percent slopes.
Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded.
Legoré channery silt loam, 25 to 35 percent slopes, severely eroded.
Montalto very stony silt loam, 25 to 50 percent slopes.

These soils are too steep for most construction. They are well suited as woodland, for parks, and as residential open areas. Some areas can be used as game preserves. Many large areas have an unobstructed view and can be used for luxury housing, but special investigation and special design are needed for each site.

BUILDING SITE GROUP 10

This group consists mainly of deep and moderately deep, moderately well drained soils on slopes that range from 0 to 12 percent. Some areas of the Lehigh soils are shallow. The soils in this group are—

Buchanan gravelly silt loam, 0 to 3 percent slopes.
Buchanan gravelly silt loam, 3 to 8 percent slopes.
Buchanan very stony silt loam, 0 to 12 percent slopes.
Glenville silt loam, 0 to 3 percent slopes.
Glenville silt loam, 3 to 8 percent slopes.
Lehigh silt loam, 0 to 3 percent slopes.
Lehigh silt loam, 3 to 8 percent slopes, moderately eroded.
Lehigh very stony silt loam, 0 to 10 percent slopes.
Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded.
Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded.
Readington silt loam, 0 to 3 percent slopes.
Readington silt loam, 3 to 8 percent slopes, moderately eroded.
Readington and Wiltshire silt loams, 0 to 3 percent slopes.
Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded.

The slopes of these soils present slight limitations for most residential, commercial, and light industrial construction, but the water table rises seasonally and, in most years, stays high for several weeks. This high water table causes problems of drainage that make it necessary to seal basements. It also interferes with the disposal of effluent from septic tanks unless a system of tile that has adequate outlets is installed before the disposal fields are established. If large disposal fields are used, these soils can be used in summer or in another season, but use all year is not advisable. The very stony Lehigh and Buchanan soils contain enough boulders to add considerably to the cost of excavating and grading.

BUILDING SITE GROUP 11

Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded, is the only soil in this group. It is deep and moderately well drained, but the water table is seasonally high and seeps are likely to occur on hillsides.

Although internal drainage is good and sites for building foundations are satisfactory, drainage is a problem when the water table rises. The sealing of basements is difficult. Also, the capacity for disposing of effluent from septic tanks is limited, and under a normal load, the waste may seep to the surface downslope.

BUILDING SITE GROUP 12

This group consists of poorly drained and somewhat poorly drained soils that occur on uplands on slopes that range from 0 to 15 percent. The soils are—

Abbottstown silt loam, 0 to 3 percent slopes.
Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded.
Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded.
Croton silt loam, 0 to 3 percent slopes.
Croton silt loam, 3 to 8 percent slopes, moderately eroded.
Guthrie silt loam.
Lamington silt loam.
Lawrence silt loam.
Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded.
Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded.
Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes.
Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes.
Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded.
Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded.
Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded.
Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded.
Rohrersville silt loam, 0 to 3 percent slopes.
Rohrersville silt loam, 3 to 8 percent slopes.
Rohrersville very stony silt loam, 0 to 8 percent slopes.
Watchung silt loam, 0 to 3 percent slopes.
Watchung silt loam, 3 to 8 percent slopes.
Watchung very stony silt loam, 0 to 8 percent slopes.
Worsham silt loam, 0 to 3 percent slopes.
Worsham silt loam, 3 to 8 percent slopes.

In most of these soils the water table is high for several months of the year, and in the Watchung, Worsham, and Guthrie soils, it is high almost all year and at times is at the surface. For any kind of structure, adequate fill is needed to raise the foundation above the water table. The fill should be adequately drained to guard against the water table rising to a new level. Sites on these soils are generally unsatisfactory for the foundations of heavy structures. These soils are severely limited in their use for septic tanks because the distribution lines of infiltration areas would be under the normal level of the water table for long periods.

BUILDING SITE GROUP 13

This group consists of soils that occur on flood plains on slopes that range from 0 to 8 percent. Flooding may occur one to three times a year or only once in several years. The soils are—

Bermudian silt loam.
Bowmansville silt loam.
Bowmansville silt loam, local alluvium, 0 to 3 percent slopes.
Bowmansville silt loam, local alluvium, 3 to 8 percent slopes.
Chewacla silt loam.
Dunning silty clay loam.
Melvin and Lindside silt loams.
Rowland silt loam.
Wehadkee silt loam.

These soils are severely limited in their use as sites for housing and other buildings, but they can be used for parks and other recreational areas.

Descriptions of the Soils

This section describes the soil series (groups of soils) and single soils (mapping units) of Adams County. The acreage and proportionate extent of each mapping unit are given in table 8.

The procedure in this section is first to describe the soil series and then the mapping units in the series. Thus to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs.

Following the name of each mapping unit, there is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit are the capability unit, the woodland suitability group, and the building site group in which the mapping unit has been placed. The pages on which each of these groups are described can be found by referring to the "Guide to Mapping Units" at the back of this report.

Soil scientists, engineers, students, and others who want detailed descriptions of the soil series should turn to the section "Formation and Classification of the Soils." Many terms used in the soil descriptions and in other parts of the report are defined in the Glossary.

Abbottstown Series

The Abbottstown series consists of moderately deep and deep, somewhat poorly drained soils that formed over red or gray and yellow sandstone and shale. These soils are along drainageways, in depressions, and in the more nearly level areas throughout the central part of the county.

A typical moderately eroded Abbottstown soil has a reddish-brown silt loam plow layer that is about 8 inches thick. This layer contains a few fragments of shale, but the layer is loose, friable, and easy to work. The upper subsoil is also reddish-brown silt loam, but it is slightly sticky and slightly plastic when wet and has weak platy structure. Distinct, grayish-brown mottles occur at a depth of about 12 inches, and there is a dense, compact layer of yellowish-red to strong-brown silty clay loam at about 16 inches. The compact layer has strong platy structure and is firm when moist and sticky and plastic when wet. The lower subsoil is shaly and feels gritty when it is rubbed between the fingers.

The surface layer ranges from reddish brown to dark grayish brown. Its texture ranges to loam near areas of Lansdale soils, and its color ranges to dark grayish brown. The subsoil is silt loam or silty clay loam. In these soils the amount of red shale fragments increases with depth, and at about 30 inches these fragments make up about 85 percent of the soil mass. Mixed with the shale is gritty silty clay loam. Depth to hard shale ranges from 28 to 60 inches.

These soils are normally strongly acid and are moderate to low in natural fertility. They have a seasonally high water table. The available moisture capacity is limited by the dense, compact layer. These soils are eroded or susceptible to erosion, particularly in the more strongly sloping, cultivated areas.

TABLE 8.—*Approximate acreage and proportionate extent of soils mapped*

Soil	Acres	Percent
Abbottstown silt loam, 0 to 3 percent slopes	10, 832	3. 2
Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded	4, 797	1. 4
Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded	8, 247	2. 4
Arendtsville gravelly loam, 0 to 3 percent slopes	97	(1)
Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded	3, 502	1. 0
Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded	2, 636	. 8
Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded	1, 659	. 5
Arendtsville gravelly loam, 15 to 25 percent slopes	954	. 3
Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded	920	. 3
Arendtsville gravelly loam, 25 to 35 percent slopes	187	. 1
Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded	217	. 1
Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded	85	(1)
Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded	391	. 1
Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded	673	. 2
Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded	199	. 1
Bermudian silt loam	284	. 1
Birdsboro silt loam, 0 to 3 percent slopes	509	. 1
Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded	2, 538	. 7
Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded	405	. 1
Bowmansville silt loam	10, 076	3. 0
Bowmansville silt loam, local alluvium, 0 to 3 percent slopes	677	. 2
Bowmansville silt loam, local alluvium, 3 to 8 percent slopes	23	(1)
Brecknock silt loam, 0 to 3 percent slopes, moderately eroded	302	. 1
Brecknock silt loam, 3 to 8 percent slopes, moderately eroded	2, 948	. 9
Brecknock silt loam, 3 to 8 percent slopes, severely eroded	589	. 2
Brecknock silt loam, 8 to 15 percent slopes, moderately eroded	1, 287	. 4
Brecknock silt loam, 8 to 15 percent slopes, severely eroded	637	. 2
Brecknock silt loam, 15 to 25 percent slopes, moderately eroded	274	. 1
Brecknock silt loam, 15 to 25 percent slopes, severely eroded	229	. 1
Brecknock silt loam, 25 to 50 percent slopes	180	. 1
Buchanan gravelly silt loam, 0 to 3 percent slopes	452	. 1
Buchanan gravelly silt loam, 3 to 8 percent slopes	1, 437	. 4
Buchanan very stony silt loam, 0 to 12 percent slopes	489	. 1
Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded	197	. 1
Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded	550	. 2
Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded	278	. 1
Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded	263	. 1
Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded	540	. 2
Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded	962	. 3
Chewacla silt loam	1, 985	. 6
Conestoga silt loam, 0 to 3 percent slopes, moderately eroded	1, 953	. 6
Conestoga silt loam, 3 to 8 percent slopes, moderately eroded	4, 271	1. 3
Conestoga silt loam, 3 to 8 percent slopes, severely eroded	328	. 1
Conestoga silt loam, 8 to 15 percent slopes, moderately eroded	286	. 1
Conestoga silt loam, 8 to 15 percent slopes, severely eroded	202	. 1
Conestoga silt loam, 15 to 25 percent slopes, severely eroded	68	(1)
Croton silt loam, 0 to 3 percent slopes	16, 981	5. 0
Croton silt loam, 3 to 8 percent slopes, moderately eroded	1, 419	. 4
Dunning silty clay loam	1, 421	. 4
Edgemont channery loam, 3 to 8 percent slopes	686	. 2
Edgemont channery loam, 8 to 15 percent slopes	855	. 2
Edgemont channery loam, 15 to 25 percent slopes, moderately eroded	178	. 1
Edgemont very stony loam, 0 to 8 percent slopes	3, 894	1. 1
Edgemont very stony loam, 8 to 25 percent slopes	11, 125	3. 3
Edgemont very stony loam, 25 to 70 percent slopes	6, 104	1. 8
Glenelg silt loam, 0 to 3 percent slopes	231	. 1
Glenelg silt loam, 3 to 8 percent slopes, moderately eroded	3, 169	. 9
Glenelg silt loam, 8 to 15 percent slopes	140	(1)
Glenelg silt loam, 8 to 15 percent slopes, moderately eroded	1, 389	. 4
Glenville silt loam, 0 to 3 percent slopes	165	. 1
Glenville silt loam, 3 to 8 percent slopes	557	. 2
Guthrie silt loam	442	. 1
Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded	363	. 1
Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded	8, 623	2. 6
Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded	10, 798	3. 2
Highfield channery silt loam, 8 to 15 percent slopes, severely eroded	2, 338	. 7
Highfield channery silt loam, 15 to 25 percent slopes	2, 548	. 8
Highfield channery silt loam, 15 to 25 percent slopes, severely eroded	1, 620	. 5
Highfield and Catoctin very stony loams, 0 to 8 percent slopes	2, 375	. 7
Highfield and Catoctin very stony loams, 8 to 25 percent slopes	11, 252	3. 3
Highfield and Catoctin very stony loams, 25 to 70 percent slopes	8, 757	2. 6
Hollinger silt loam, 3 to 8 percent slopes, moderately eroded	62	(1)
Hollinger silt loam, 8 to 15 percent slopes, severely eroded	61	(1)
Hollinger silt loam, 15 to 25 percent slopes, severely eroded	134	(1)
Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded	1, 239	. 4
Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded	8, 592	2. 6
Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded	1, 924	. 6
Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded	3, 335	1. 0
Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded	3, 804	1. 1
Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded	1, 645	. 5
Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded	430	. 1
Lamington silt loam	913	. 3
Lansdale loam, 0 to 3 percent slopes, moderately eroded	174	. 1

TABLE 8.—*Approximate acreage and proportionate extent of soils mapped*—Continued

Soil	Acres	Percent
Lansdale loam, 3 to 8 percent slopes, moderately eroded	1, 718	0. 5
Lansdale loam, 3 to 8 percent slopes, severely eroded	259	. 1
Lansdale loam, 8 to 15 percent slopes, moderately eroded	103	(1)
Lansdale loam, 8 to 15 percent slopes, severely eroded	189	. 1
Lawrence silt loam	3, 612	1. 1
Legore channery silt loam, 3 to 8 percent slopes, moderately eroded	2, 118	. 6
Legore channery silt loam, 8 to 15 percent slopes, moderately eroded	649	. 2
Legore channery silt loam, 8 to 15 percent slopes, severely eroded	1, 281	. 4
Legore channery silt loam, 15 to 25 percent slopes, severely eroded	1, 280	. 4
Legore channery silt loam, 25 to 35 percent slopes, severely eroded	244	. 1
Lehigh silt loam, 0 to 3 percent slopes	2, 559	. 7
Lehigh silt loam, 3 to 8 percent slopes, moderately eroded	12, 249	3. 6
Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded	3, 447	1. 0
Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded	3, 005	. 9
Lehigh very stony silt loam, 0 to 10 percent slopes	922	. 3
Manor loam, 3 to 8 percent slopes, moderately eroded	242	. 1
Manor loam, 8 to 15 percent slopes, moderately eroded	464	. 1
Manor loam, 8 to 15 percent slopes, severely eroded	499	. 1
Manor loam, 15 to 25 percent slopes, severely eroded	475	. 1
Melvin and Lindside silt loams	796	. 2
Montalto silt loam, 0 to 3 percent slopes	350	. 1
Montalto silt loam, 3 to 8 percent slopes, moderately eroded	7, 466	2. 2
Montalto silt loam, 8 to 15 percent slopes, moderately eroded	2, 685	. 8
Montalto very stony silt loam, 0 to 8 percent slopes	1, 492	. 4
Montalto very stony silt loam, 8 to 25 percent slopes	2, 412	. 7
Montalto very stony silt loam, 25 to 50 percent slopes	1, 265	. 4
Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded	466	. 1
Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded	2, 137	. 6
Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded	130	(1)
Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes	1, 579	. 5
Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes	1, 968	. 6
Myersville silt loam, 0 to 3 percent slopes, moderately eroded	152	(1)
Myersville silt loam, 3 to 8 percent slopes, moderately eroded	2, 387	. 7
Myersville silt loam, 8 to 15 percent slopes, moderately eroded	2, 573	0. 8
Myersville silt loam, 8 to 15 percent slopes, severely eroded	631	. 2
Myersville silt loam, 15 to 25 percent slopes	515	. 1
Myersville silt loam, 15 to 25 percent slopes, severely eroded	1, 047	. 3
Penn silt loam, 0 to 3 percent slopes, moderately eroded	2, 461	. 7
Penn silt loam, 3 to 8 percent slopes, moderately eroded	22, 210	6. 6
Penn silt loam, 3 to 8 percent slopes, severely eroded	3, 345	1. 0
Penn silt loam, 8 to 15 percent slopes, moderately eroded	2, 152	. 6
Penn silt loam, 8 to 15 percent slopes, severely eroded	2, 713	. 8
Penn silt loam, 15 to 25 percent slopes, moderately eroded	144	(1)
Readington silt loam, 0 to 3 percent slopes	7, 060	2. 1
Readington silt loam, 3 to 8 percent slopes, moderately eroded	9, 407	2. 8
Readington and Wiltshire silt loams, 0 to 3 percent slopes	3, 255	1. 0
Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded	547	. 2
Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded	1, 122	. 3
Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded	2, 511	. 7
Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded	622	. 2
Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded	762	. 2
Rohrersville silt loam, 0 to 3 percent slopes	1, 406	. 4
Rohrersville silt loam, 3 to 8 percent slopes	1, 006	. 3
Rohrersville very stony silt loam, 0 to 8 percent slopes	1, 967	. 6
Rowland silt loam	4, 247	1. 3
Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded	594	. 2
Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded	69	(1)
Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded	228	. 1
Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded	109	(1)
Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded	130	(1)
Watchung silt loam, 0 to 3 percent slopes	6, 112	1. 8
Watchung silt loam, 3 to 8 percent slopes	1, 058	. 3
Watchung very stony silt loam, 0 to 8 percent slopes	388	. 1
Wehadkee silt loam	4, 073	1. 2
Worsham silt loam, 0 to 3 percent slopes	463	. 1
Worsham silt loam, 3 to 8 percent slopes	236	. 1
Mines and pits	438	. 1
Made land	108	(1)
Total	336, 640	100. 0

[1] Less than 0.05 percent.

The Abbottstown soils occur with the Penn, Readington, Croton, and Reaville soils. They are less red and more poorly drained than the Penn and Readington soils and are less gray and less poorly drained than the Croton soils. Abbottstown soils are deeper to hard shale than the moderately well drained Reaville soils.

Abbottstown silt loam, 0 to 3 percent slopes (AbA).—This soil is less eroded than the soil described for the series, but it is like that soil in other respects. Runoff is slow in most areas, and a seasonally high water table is the result of impeded drainage in the subsoil.

This soil is suited to a cropping system that consists of a row crop, a small grain, and 2 years of hay. Suitable crops are corn, small grain, birdsfoot trefoil, ladino clover, and timothy. Because wetness is a major limitation, bedding is normally needed to dispose of surface water. Graded stripcropping, supplemented with diversion terraces and waterways, is helpful in managing water. Spots that remain wet should be drained with tile where possible. (Capability unit IIIw–1; woodland group 12; building site group 12)

Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded (AbA2).—This soil is suited to about the same kinds of crops as is Abbottstown silt loam, 0 to 3 percent slopes, and requires about the same management.

In cultivated areas with slopes of more than 2 percent, practices are needed to control erosion. For this control, graded stripcropping and cover crops are sufficient in most places. Bedding and tile are needed for drainage, and diversion terraces are needed to carry off excess water. (Capability unit IIIw–1; woodland group 12; building site group 12)

Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded (AbB2).—Erosion has removed much of the original surface layer, and in some places this soil is not more than 24 inches deep to hard shale or sandstone. A seasonally high water table and much surface runoff are the result of impeded drainage in the subsoil. The runoff adds to the erosion hazard. Tilth is poor in some places where the silty clay loam subsoil is mixed with the plow layer.

This soil is suited to a cropping system of low intensity that consists of a row crop, a small grain, and at least 2 years of hay or pasture. Suitable crops are corn, small grain, birdsfoot trefoil, ladino clover, and timothy. In cultivated areas graded stripcropping, supplemented with diversion terraces and waterways, may be needed to manage water and control erosion. Open ditches help to dispose of surface water in low areas and seep spots. Spots that remain wet should be drained with tile. This soil is compacted and its structure is destroyed if it is worked or if grazing is permitted when it is wet. (Capability unit IIIw–1; woodland group 12; building site group 12)

Arendtsville Series

The Arendtsville series consists of deep, well-drained soils that formed in reddish-brown gravelly material of mixed origin. The underlying rock is a coarse mixture consisting of angular and rounded pebbles, cobbles, and boulders of quartzite, sandstone, quartz, and other rocks that are loosely cemented in a matrix that is generally loamy but is sandy in some places. These soils are in the north-central part of Adams County on the rolling foot slopes of South Mountain.

A moderately eroded, sloping Arendtsville soil that is typical of the series has a dark reddish-brown gravelly surface layer about 9 inches thick. This layer grades to a reddish-brown, gravelly heavy silt loam subsoil that is slightly sticky when wet. At a depth of 40 inches and below, the underlying material is reddish-brown gravelly loam that permits deep penetration of roots. Depth to hard bedrock is about 5 to 20 feet.

Under good management, these soils do not erode easily. Their porous surface soil absorbs water fairly rapidly. Enough clay occurs in the subsoil to hold large amounts of water available for the use of plants. These soils are slightly acid to extremely acid. In some places the extreme acidity of the lower subsoil may be the result of using sulfur sprays for a long period.

The Arendtsville soils occur between areas of Highfield and Myersville soils on the steeper, higher slopes to the north and west, and areas of the Penn and Montalto soils on the Gettysburg Plain to the south and east. The Arendtsville soils are slightly deeper than the Myersville and Highfield soils and are redder than the Highfield soils. They are deeper than the Penn soils and contain less sandstone and shale throughout. Arendtsville soils are less sticky and plastic in the subsoil than the Montalto soils.

The Arendtsville soils are not extensive in Adams County. Except for the steep and the severely eroded areas, they are well suited to the general crops commonly grown in the county. They are especially well suited to alfalfa and other deep-rooted crops. On the slopes of South Mountain where air drainage is generally good, these soils are some of the best soils for orchards in Adams County. Some areas of these soils are woodlands containing white oak, red oak, tulip-poplar, wild cherry, hickory, and sassafras.

Arendtsville gravelly loam, 0 to 3 percent slopes (AgA).—This soil is more nearly level and slightly deeper than the soil described for the series, but it is like that soil in other respects. A few areas mapped as this soil are moderately eroded.

Because this soil generally is in small areas on crests of hills, it normally is used in the same way as are larger areas of steeper soils downslope. It is well suited to crops commonly grown in the county. A suitable cropping system consists of 2 years of row crops, 1 year of a small grain, and 1 year of hay. This soil is productive and easy to manage, and erosion is not a problem. It is not so well suited to bush and tree fruits as are some of the more sloping Arendtsville soils, because air drainage is slow and frost pockets are likely. (Capability unit I–1; woodland group 5; building site group 1)

Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded (AgB2).—The profile of this soil is the one described for the series. Included in mapped areas are severely eroded areas.

This soil is suited to row crops, orchards, hay, and pasture. It is also suited to alfalfa or a grass-legume mixture grown for hay and pasture. About 10 percent of the acreage is woodland. If row crops are grown, contour farming and stripcropping are needed to reduce runoff and to help control erosion. Diversion terraces and waterways are also needed in some places. A suitable cropping system consists of a row crop, a small grain, and 2 years of hay.

Trees in new orchards should be planted on the contour so that they benefit from maximum infiltration and storage of water. To reduce runoff, the orchards can be kept in permanent sod, or cover crops can be planted and trashy cultivation used. (Capability unit IIe–2; woodland group 5; building site group 1)

Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded (AgC2).—This is the most extensive Arendtsville soil in Adams County. About one-fourth of the original surface soil has been removed by erosion, and the rest has been mixed with the reddish upper subsoil. Because slopes are generally rolling and complex, practices to control erosion are difficult to apply. Included in mapped areas are small gently sloping areas and slightly eroded areas.

This soil is one of the best soils for orchards in Adams County. The roots of fruit trees penetrate deeply into the porous subsoil, where there is enough clay to hold large amounts of moisture and plant nutrients. In addition, good air drainage down the slopes reduces the danger of frost in spring and fall. More moisture is absorbed and retained if the fruit trees are planted on the contour. A grass-legume mixture seeded between the rows will help to reduce runoff.

Some areas are used for row crops. A suitable cropping system is a row crop, a small grain, and 1 year of hay. Runoff and erosion can be controlled by contour farming, stripcropping, diversion terraces, and waterways. This soil is also well suited to a grass-legume mixture grown for hay and pasture. Some of this soil is wooded. (Capability unit IIIe–2; woodland group 5; building site group 2)

Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded (AgC3).—Erosion has removed most of the original surface layer from this soil, and in many places the subsoil is exposed. In cultivated areas much of the subsoil has been mixed into the plow layer. Crops can be grown in a cropping system of very low intensity that consists of a row crop, a small grain, and 3 or more years of hay or pasture. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. This soil is well suited to orchards, but practices are needed to control further erosion. If crops are grown, contour strips, diversion terraces, and waterways are needed. (Capability unit IVe–1; woodland group 5; building site group 2)

Arendtsville gravelly loam, 15 to 25 percent slopes (AgD).—This soil is much steeper than the soil described for the series, and in most places it has a dark surface layer that is not so deep. A cover of trees has protected most of this soil from erosion. Included in mapped areas are small moderately eroded areas.

This soil is suitable for orchards, but the limitations to the use of equipment and other problems of management are greater than on the less sloping Arendtsville soils. If crops are grown, management is needed to control erosion, to conserve moisture, and to maintain the organic-matter content. A suitable cropping system is a row crop, a small grain, and 3 years or more of hay. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. Areas used as cropland should be protected by contour stripcropping, diversion terraces, and grassed waterways. (Capability unit IVe–1; woodland group 5; building site group 2)

Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded (AgD3).—This severely eroded, steep soil is shallower to bedrock than the soil described for the series. Erosion has removed most of the original surface layer and has exposed patches of the red subsoil. In some places gullies have formed. This erosion has reduced the ability of this soil to absorb and hold moisture that plants can use, and additional moisture is lost in the rapid runoff.

This soil is suitable for pasture or for orchards, if the orchards are sodded. The orchards produce fair yields of fruit. Suitable pasture plants are birdsfoot trefoil, orchardgrass, and bluegrass. Careful management is needed to control erosion and to conserve moisture. Pastures should be protected from overgrazing. (Capability unit VIe–3; woodland group 5; building site group 2)

Arendtsville gravelly loam, 25 to 35 percent slopes (AgE).—This steep soil is slightly shallower than the soil described for the series. It has been wooded most of the time and therefore is not more than slightly eroded. Because slopes are steep and erosion is likely if they are cultivated, the use of this soil should be limited to pasture or to orchards kept in permanent sod. Suitable pasture plants are birdsfoot trefoil, orchardgrass, and bluegrass. The management needed includes adding lime and fertilizer as indicated by soil tests, rotating grazing, and clipping the pasture to control weeds. (Capability unit VIe–3; woodland group 6; building site group 9)

Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded (AgE3).—This steep, severely eroded soil is shallower than the soil described for the series. Most of the original surface soil has been removed, and gullies have formed in cleared areas and in breaks in the woodland. In most places the red silty clay subsoil is exposed. This soil can be used as woodland, wildlife habitat, and recreational areas. It is best suited to drought-resistant plants. (Capability unit VIIe–1; woodland group 6; building site group 9)

Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded (AgF2).—This steep, eroded soil is shallower than the soil described for the series, and it is more susceptible to severe erosion. Included in mapped areas are small very steep, severely eroded areas and small slightly eroded areas.

This soil is not suited to crops, pasture, or orchards. Most of the acreage is wooded and should remain so, for yields of trees are good. Some areas can be used for limited grazing. Wildlife habitat or recreational areas can be developed on this soil. (Capability unit VIIe–1; woodland group 6; building site group 9)

Athol Series

The Athol series consists of deep or very deep, well-drained, medium-textured soils that formed in material weathered from reddish, calcareous conglomerate containing a few quartz pebbles and a little gravel. Most of the acreage of these soils occurs in the undulating or gently rolling areas in the valley that contains the town of Fairfield. A small moderately rolling area is northwest of York Springs, and a slightly larger moderately rolling to hilly area is in the Pigeon Hills in the extreme eastern part of the county.

A gently sloping Athol soil typical of the series has a gravelly silt loam surface layer that is about 10 inches

thick and is easy to work. This layer is underlain by a reddish-brown clay loam subsoil that is slightly acid. The subsoil is more clayey than the surface layer and has stronger structure. It is firm when moist and is sticky and plastic when wet. The subsoil extends to a depth of about 64 inches and is underlain by a thin substratum of yellowish-brown gravelly fine silt loam. Hard, calcareous conglomerate is generally at a depth of about 70 inches.

In areas near the Penn and Arendtsville soils, the Athol soils are generally colored as is the soil described as typical of the Athol series, but in some places they are less red, particularly where the underlying conglomerate merges with limestone that contains no red shale. In other places the entire profile is less gravelly. The subsoil ranges from clay loam to silty clay. Coarse fragments make up 5 to 25 percent of the soil mass. The gravel ranges from coarse to very fine and is finest in areas where these soils are reddest. Calcareous conglomerate material crops out on the steeper slopes in the area of Pigeon Hills, and limestone crops out in an area northwest of Fairfield.

These soils are slightly acid to neutral in the lower subsoil, but in most places they are strongly acid in the upper part of the profile. They have high available moisture capacity. These soils are easily worked, and crops on them respond to good management.

The Athol soils occur near the Penn soils, the Arendtsville soils in the vicinity of York Springs, the Myersville soils in the mountainous area in the western part of the county, and the Highfield soils in the area of Pigeon Hills. They resemble the Penn soils in color but are much deeper and less acid than those soils and have higher available moisture capacity. The Athol soils have stronger structure and finer texture than the Arendtsville soils. Also, the pH in the lower subsoil is higher. Athol soils resemble the Myersville soils but developed in more calcareous material. They are deeper and redder than the Highfield soils.

These soils occupy only a small acreage. Under good management, they are as productive as any soil in the county.

Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded (AtA2).—This is the soil described as typical of the series. Included in mapped areas are a few uneroded areas and small areas of a brighter colored, finer textured soil that developed in colluvium over limestone.

This soil is well suited to the crops commonly grown in the county, but frost may damage fruit trees. Satisfactory crop yields can be obtained by adding green manure and barnyard manure, by growing cover crops, and by applying fertilizer liberally. A suitable cropping system consists of a row crop, a cover crop, a row crop, a winter grain, and hay. Contour farming and contour stripcropping are needed on slopes of 2 percent or more so that moisture is conserved and erosion is controlled. (Capability unit IIe–1; woodland group 5; building site group 1)

Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded (AtB2).—This soil has a profile like the one described for the series. Included in mapped areas are small severely eroded areas, small slightly eroded areas, and small areas consisting of a brighter colored, finer textured, deep soil that formed in colluvium over limestone.

This soil is suited to the crops commonly grown in the county and to bush and tree fruits. Fruits may be damaged in the frost pockets of low areas and depressions. Yields of crops are satisfactory if the cropping system is suitable, if erosion is controlled, if manure is applied regularly, and if fertilizer is applied liberally. Hay should be grown for at least 1 year in a 4-year rotation. On the longer slopes, contour stripcropping, supplemented with diversion terraces and waterways, is needed. (Capability unit IIe–1; woodland group 5; building site group 1)

Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded (AtC2).—This soil is steeper and slightly less deep to bedrock than the soil described as typical of the series. Included in mapped areas are small slightly eroded areas, small severely eroded areas, and areas consisting of a brighter colored soil that is deeper to bedrock than Athol soils.

This soil is well suited to fruit, crops, and pasture. Cover crops and contour stripcropping, supplemented with diversion terraces and waterways, are needed to control erosion and to conserve moisture. A suitable cropping system is a row crop, a winter grain, and 2 years of hay. Suitable crops are corn, small grain, alfalfa, and orchardgrass. (Capability unit IIIe–1; woodland group 5; building site group 2)

Bermudian Series

Soils of the Bermudian series are deep and well drained. They formed in sediments washed mainly from areas of the Penn, Readington, and Lansdale soils. In some places new sediments are added by floods that occur about once in 3 or 4 years but do not last long.

A typical Bermudian soil has a yellowish-red silt loam plow layer about 10 inches thick. This layer is loose, very friable, and easy to work. It generally contains a few pieces of rounded gravel and a few fragments of shale. The subsoil is friable, dark-red shaly silt loam about 40 inches thick. Hard shale is at a depth of about 50 inches.

The surface layer ranges from yellowish red to dark reddish brown. The subsoil ranges from fine silt loam to very shaly silt loam and from dark red to yellowish red. In some places the subsoil is underlain by sand and gravel at a depth of 2 or 3 feet. Fine to medium fragments of shale and pieces of rounded gravel occur throughout the profile and generally increase in amount with depth.

These soils are very strongly acid, except in areas that have been limed or where the bedrock contains a considerable amount of carbonate. They are rapidly permeable and have fairly high available moisture capacity. Fertility is generally moderate, and it is improved when sediments are added by the floods. Runoff is slow, and generally erosion is not a hazard.

The Bermudian soils occur near the Birdsboro, Rowland, and Bowmansville soils. They have a less well developed profile than the Birdsboro soils and, unlike those soils, are subject to flooding. They are higher than the Rowland and Bowmansville soils and are better drained, are redder throughout, and are somewhat coarser textured.

The Bermudian soils are not extensive in Adams County, but practically all of the acreage is used for the crops commonly grown in the county. Yields are favorable.

Bermudian silt loam (0 to 3 percent slopes) (Be).—This is the only Bermudian soil mapped in Adams County, but small areas of fine sandy loam are included in the mapped areas. This soil is susceptible to flooding or

scouring that causes some damage in years of high rainfall. Satisfactory yields of row crops, which can be grown continuously, are produced, but large additions of fertilizer, lime, and manure are needed. A cover crop helps to protect the soil from scouring in winter and early in spring. (Capability unit I–2; woodland group 1; building site group 13)

Birdsboro Series

The Birdsboro series consists of deep, well-drained soils that formed in alluvium washed wholly or partly from soils underlain by red shale and sandstone. Slopes are generally gentle and convex. These soils are in fairly small areas on high bottoms above the flood plains of Conewago, Bermudian, Rock, and Alloway Creeks and some smaller streams.

A typical moderately eroded Birdsboro soil has a reddish-brown silt loam plow layer about 9 inches thick. This layer has weak, fine, granular structure, is friable when moist, and is easy to work. The upper subsoil is yellowish-red silty clay loam that is slightly sticky and slightly plastic when wet, but it breaks into rounded blocks if it is disturbed. The lower subsoil red shaly silt loam—is underlain by dark-red weathered shale and siltstone at a depth of about 40 inches. Hard shale occurs at a depth of about 54 inches.

The surface layer is generally silt loam, but it ranges to loam or, in a few places, to sandy loam. In color the surface layer ranges from brown to red. The subsoil ranges from yellowish brown to dark red and from silt loam to silty clay loam. Depth to bedrock ranges from a few feet to 8 feet or more.

The Birdsboro soils occur near the Bermudian, Readington, and Lamington soils. They occupy higher positions than the Bermudian soils and have a more strongly developed profile. The Birdsboro soils have a redder, better drained subsoil than the Readington soils, and they are much better drained than the Lamington soils.

Most of the acreage of Birdsboro soils is nearly level or gently sloping and slightly eroded or moderately eroded. These soils are suited to the crops commonly grown in the county, but not to orchards. Crops respond well to lime and fertilizer.

Birdsboro silt loam, 0 to 3 percent slopes (BmA).—This soil is less eroded and has a thicker surface layer than the soil described for the series. Included in mapped areas are some moderately eroded areas and a few areas that have a loam or sandy loam surface layer.

This soil is well suited to a cropping system of very high intensity in which corn, potatoes, small grain, or alfalfa may be grown continuously. A suitable cropping system is a row crop, a cover crop, a row crop, a small grain, and hay. This soil is also well suited to bush fruits, but not to tree fruits. Air drainage is poor on this level soil, and tree fruits are likely to be damaged by frost pockets.

On slopes of more than 2 percent, contour farming is generally needed to conserve moisture and to help control erosion. The organic-matter content and soil structure can be maintained by seeding cover crops, adding manure, and mixing crop residue into the soil. Areas in bush fruits should be mulched or seeded to a winter cover crop to help maintain organic-matter content and soil structure and to conserve moisture. (Capability unit I–1; woodland group 5; building site group 1)

Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded (BmB2).—This is the soil described as typical of the Birdsboro series. Included in mapped areas are some severely eroded areas and a few areas that have a loam or sandy loam surface layer.

This soil is suited to a cropping system of high intensity. One such system is 2 years of row crops, 1 year of a small grain, and 1 year of hay. Suitable crops are corn, potatoes, bush fruits, small grain, alfalfa, and orchardgrass. Adding manure and returning large amounts of crop residue to the soil help to maintain soil structure and organic-matter content, to conserve moisture, and to control erosion. Contour stripcropping, diversion terraces, and waterways are needed to control excessive erosion. Areas in bush fruits should be mulched or protected by cover crops. (Capability unit IIe–1; woodland group 5; building site group 1)

Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded (BmC2).—This strongly sloping soil is more susceptible to erosion than the soil described for the series. Included in mapped areas are steep areas and severely eroded areas.

This soil is suitable for a cropping system of medium intensity. One such system is 1 year of a row crop, 1 year of a small grain, and 1 year of hay. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, diversion terraces, and waterways are needed to help control erosion. Adding manure, growing cover crops, and returning crop residue to the soil help to maintain soil structure and the content of organic matter. Bush fruits do well in areas that are mulched or are planted to cover crops. Yields of tree fruits are adequate if the management of the orchards is at a high level. (Capability unit IIIe–1; woodland group 5; building site group 2)

Bowmansville Series

The Bowmansville series consists of somewhat poorly drained or poorly drained soils that formed on flood plains, mainly from alluvium that washed from areas of Penn and Lansdale soils. Bowmansville soils are along streams and large drainageways in the central part of the county. They have a high water table.

A typical Bowmansville soil has a dark reddish-brown silt loam plow layer about 8 inches thick. This layer crumbles easily into fine granules. It is friable when moist and slightly sticky and slightly plastic when wet. The subsoil is dark reddish-gray fine silt loam mottled with yellowish red. It crumbles fairly easily and is firm when moist and slightly sticky and slightly plastic when wet. At a depth of 18 inches or more, the soil material feels gritty.

The surface layer of these soils is generally silt loam, but it ranges to gravelly loam and, in a few areas, to sandy loam. Varying amounts of sand and gravel occur throughout the profile, and in many places the amount of sand increases with depth. The color of these soils and the intensity of mottling vary according to texture and to the depths to the water table.

The Bowmansville soils occur near the moderately well drained Rowland soils and the well drained Bermudian

soils. In some areas they are near the Birdsboro, Readington, and Lamington soils on benches and the Chewacla soils on flood plains. The Bowmansville soils are lighter colored and coarser textured than the Chewacla soils.

Bowmansville silt loam (0 to 3 percent slopes) (Bn).—This is the soil described as typical of the series. It occurs in level or gently sloping areas and is likely to be scoured during the frequent floods. The water table is high for much of the year, and generally this soil is the last one in the county to dry in spring. Wetness is a severe hazard. Permeability is very slow in the subsoil, and the available moisture capacity is low to moderate.

This soil is suited to a cropping system of low intensity. One such system is 1 year of a row crop, 1 year of a small grain, and 2 years of hay. Suitable crops are corn, winter grain, red clover, ladino clover, and timothy. Crop yields can be increased if drainage is improved by bedding, open ditches, and random tile. Mixing crop residue with the soil and adding manure help to maintain the organic-matter content, to slow leaching, and to improve soil structure. Cover crops should be planted and crop residue left on the surface until it is mixed into the soil. This soil is compacted and its structure is damaged if it is tilled or if grazing is permitted when the soil is wet. (Capability unit IIIw-3; woodland group 3; building site group 13)

Bowmansville silt loam, local alluvium, 0 to 3 percent slopes (BoA).—Most of this soil occurs in level or nearly level areas that are generally close to the streambanks. Most areas are covered with 6 inches to 2 feet of alluvial-colluvial material. The alluvium in this material is local alluvium, for this soil is not flooded by water from the streams. Much of the soil material is from the adjoining slopes. The water table is high much of the year because the subsoil is slowly permeable and water seeps in from the adjoining slopes. Included in mapped areas are some eroded areas.

Drainage is the most important management problem. Diversion terraces at the foot of slopes help to control both runoff and seepage. Bedding, random tile and open ditches with suitable outlets are needed in some places. Drained areas are suited to corn, winter grain, birdsfoot trefoil, ladino clover, and timothy. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or another system of low intensity. On slopes of more than 2 percent, erosion can be controlled by using graded stripcropping, supplemented with diversion terraces and waterways. (Capability unit IIIw-1; woodland group 3; building site group 13)

Bowmansville silt loam, local alluvium, 3 to 8 percent slopes (BoB).— This soil occurs in drainageways or near the banks of streams where runoff has deposited material. A few inches to 2 feet of alluvium and colluvium has been deposited on the surface. Seepage from the adjoining slopes is considerable. Included in mapped areas are eroded areas, areas steeper than 8 percent, and a few small, very poorly drained areas.

Drainage is the most important management problem. Diversion terraces at the foot of adjoining slopes help to control both runoff and seepage. Drainage can be improved by installing tile drains. The fertility of this soil has been enriched by the lime, fertilizer, and organic matter in the material that washed from cultivated fields on nearby slopes. Corn, winter grain, birdsfoot trefoil, ladino clover, and timothy are suitable crops. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or another system of low intensity. Graded stripcropping, supplemented with diversion terraces and waterways, helps to dispose of excess water and to control erosion. (Capability unit IIIw-1; woodland group 3; building site group 13)

Brecknock Series

The Brecknock series consists of well-drained, moderately deep or deep soils that formed over porcelanite or over metamorphosed sandstone. The porcelanite is a hard, grayish or bluish rock that formed when heat and pressure from diabase intrusions baked the underlying shale. These soils occur mostly on moderately sloping or gently sloping ridges between areas of Montalto and Penn soils in the central part of the county.

A moderately eroded Brecknock soil typical of the series has a very dark grayish-brown silt loam plow layer about 9 inches thick. This layer has fine granular structure, is easy to work, and absorbs water readily. The subsoil is dark-brown channery silt loam streaked with strong brown and gray. It has subangular blocky structure that is somewhat stronger in the lower part than in the upper. The substratum, at a depth of 28 inches, consists of dark grayish-brown fragments of weathered porcelanite and silty clay loam between the coarse fragments. The depth to rock is normally 1½ to 3 feet.

Some areas of these soils have a channery surface layer. In some areas the profile is not so thick as the one described, but in other areas rock is at a depth of more than 3 feet. The subsoil ranges from silt loam to silty clay loam. Texture and color of these soils vary considerably, depending on the underlying material. In areas where diabase occurs, texture is finer and color is redder than in areas where these soils were formed from metamorphosed sandstone. In areas of sandstone many fragments occur and color is lighter. Where these soils were formed from metamorphosed shale, texture is silty, color is olive or bluish gray, and slate occurs.

These soils are strongly acid to slightly acid. Permeability is rapid in the surface layer and is moderate in the subsoil. In some places the lower part of the subsoil has slightly impeded drainage.

The Brecknock soils occur near the Penn, Legore, Montalto, Lehigh, and Croton soils. They are better drained than the moderately well drained or somewhat poorly drained Lehigh soils and the poorly drained Croton soils. The Brecknock soils are more channery and less red than the Penn soils and are more channery or shaly, more acid, and grayer than the Legore and Montalto soils. In some areas Brecknock soils are near the Lansdale, Readington, Steinsburg, Klinesville, Mount Lucas, and Reaville soils.

Brecknock silt loam, 0 to 3 percent slopes, moderately eroded (BrA2).—This level or nearly level soil is generally the deepest soil of the Brecknock series in the county. It has moderate to high available moisture capacity. Included in mapped areas are a few areas less than 32 inches to weathered material.

This soil is suited to corn, small grain, alfalfa, and orchardgrass. Crops can be grown in a cropping system of medium intensity that consists of a row crop, a small grain, and hay. Contour stripcropping, supplemented with diversion terraces and waterways, is needed on slopes of 2

percent or more. (Capability unit IIe 3; woodland group 11; building site group 5).

Brecknock silt loam, 3 to 8 percent slopes, moderately eroded (BrB2).—The profile of this soil is the one described for the series. Erosion has removed as much as one-half of the original surface soil, and some of the subsoil has been mixed into the plow layer. The available moisture capacity is moderate. Included in mapped areas are a few areas of channery silt loam and a few areas that are only slightly eroded.

This soil is suited to corn, small grain, alfalfa, and orchardgrass. A cropping system of medium intensity that consists of a row crop, a small grain, and hay can be followed. Cover crops, contour stripcropping, diversion terraces, and waterways help to control erosion. (Capability unit IIe–3; woodland group 11; building site group 5)

Brecknock silt loam, 3 to 8 percent slopes, severely eroded (BrB3).—This severely eroded soil is shallower to bedrock than the soil described for the series. The depth to weathered material is only about 24 inches. Because three-fourths or more of the surface layer has been lost, the available moisture capacity has been seriously reduced. Included in mapped areas are some channery areas and some areas where the weathered material is at a depth of less than 24 inches.

This soil can be used as cropland if erosion is controlled, moisture is conserved, and the content of organic matter is increased. Suitable crops are corn, small grain, alfalfa, and orchardgrass. A suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 2 years of hay, or another system of low intensity. Contour stripcropping, diversion terraces, and waterways are needed to help control erosion and conserve moisture. Pastures should be well managed. (Capability unit IIIe–3; woodland group 14; building site group 5)

Brecknock silt loam, 8 to 15 percent slopes, moderately eroded (BrC2).—This soil is steeper than the soil described for the series. Erosion is a serious hazard. The available moisture capacity is moderate. Included in mapped areas are uneroded areas that are mostly wooded.

This soil is suited to corn, small grain, alfalfa, and orchardgrass. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or some other system of low intensity. Pastures should be well managed. (Capability unit IIIe–3; woodland group 11; building site group 6)

Brecknock silt loam, 8 to 15 percent slopes, severely erodod (BrC3).—This strongly sloping, severely eroded soil is shallower than the soil described for the series. Depth to weathered material is about 24 inches. Further erosion is a serious hazard. The available moisture capacity is moderate to low. Included in mapped areas are channery areas and a few areas where the weathered material is at a depth of less than 24 inches.

Suitable crops are corn, small grain, alfalfa, and orchardgrass. A cropping system of very low intensity should be followed. One such system consists of a row crop, a small grain, and 3 or 4 years of hay. Cover crops, contour stripcropping, diversion terraces, and waterways are needed to control erosion. Pasture and meadow should be well managed. (Capability unit IVe–2; woodland group 14; building site group 6)

Brecknock silt loam, 15 to 25 percent slopes, moderately eroded (BrD2).—This soil is much steeper than the soil described for the series, and it is not so deep to the underlying rock. Included in mapped areas are small areas of channery silt loam.

Hay can be grown on slopes of less than 20 percent if management is good. The fields should be seeded to birdsfoot trefoil, orchardgrass, or other drought-resistant plants. Crops can be grown in a cropping system consisting of 1 year of corn, 1 year of a small grain, and 3 or more years of hay, or in another system of very low intensity. Seeding should be in contour strips, and diversion terraces should be constructed on long slopes. Waterways may be needed in draws and to serve as outlets for diversions. (Capability unit IVe-2; woodland group 11; building site group 6)

Brecknock silt loam, 15 to 25 percent slopes, severely eroded (BrD3).—This moderately steep soil is shallower to the underlying rock material than the soil described for the series. Because most of the original surface layer has been lost through erosion, the available moisture capacity has been seriously reduced. Included in areas mapped as this soil are areas of channery silt loam.

This soil is suited to pasture if intensive practices are used to control further erosion, conserve moisture, and replenish organic matter. The pasture should be seeded to birdsfoot trefoil, orchardgrass, or other drought-resistant plants. Reseeding should be in contour strips, and grazing should be controlled. (Capability unit VIe–2; woodland group 14; building site group 6)

Brecknock silt loam, 25 to 50 percent slopes (BrE).—This steep soil is on sharp, narrow breaks and is less deep to bedrock than the soil described for the series. Depth to bedrock is about 18 inches. Included in mapped areas are many channery areas and some stony areas. Also included are eroded areas and areas having slopes of more than 50 percent.

Most of this soil is wooded. Slopes are too steep for cultivation, and grazing is severely limited. This soil should be kept in trees. Areas of this soil make good wildlife habitat and recreational areas. (Capability unit VIIe–1; woodland group 18; building site group 9)

Buchanan Series

Soils of the Buchanan series are deep and moderately well drained. They formed in colluvial and alluvial material that weathered from greenstone, metarhyolite, basalt, quartzite, and other felsitic and sericitic rocks. These soils occur in drainageways and depressions in the mountainous areas in the western and northwestern parts of the county. They are strongly acid or medium acid.

A Buchanan soil typical of the series has a brown gravelly silt loam surface layer about 11 inches thick. This layer has fine granular structure, is very friable when moist, and has a content of gravel measuring about 20 percent. The subsoil is yellowish-brown gravelly loam that has weak subangular blocky structure and is slightly plastic when wet. The content of sand, gravel, and clay generally increases with depth. Pale-brown mottles occur at a depth of about 17 inches. A fragipan is at a depth of 37 inches. This pan has platy structure and is sticky when wet. At a depth of 44 inches, the substratum is mottled with brown, red, and gray and consists mostly of weathered and semiweathered gravelly and stony material or rock fragments in a sandy matrix.

These soils are generally more than 36 inches thick. The colluvial deposits range from a few feet to 50 feet in thickness. A fairly large amount of coarse fragments occurs on the surface and throughout the profile. The surface layer is pale-brown to yellowish-brown silt loam, loam, or sandy loam. The subsoil is yellowish-brown to yellowish-red loam, sandy clay loam, silty clay, or clay loam mottled with brownish yellow, brown, or reddish yellow. Some areas are very stony and are mapped separately in this county.

The Buchanan soils occur near the poorly drained Rohrersville soils and the well drained Myersville, Highfield, and Catoctin soils.

Buchanan gravelly silt loam, 0 to 3 percent slopes (BuA).—This moderately well drained soil has a moderately permeable subsoil and, in some low areas, the water table is high in winter and early in spring. Included in mapped areas are a few well-drained areas and some eroded areas.

This soil is suited to a cropping system that consists of 2 years of row crops, 1 year of a small grain, and 1 year of hay, or to another system of high intensity. Suitable crops are corn, small grain, alfalfa, and orchardgrass. If alfalfa is grown, seed a variety tolerant of wetness and provide adequate drainage.

Because the water table is seasonally high and the subsoil is only moderately permeable, random tile, graded rows, and open ditches are generally needed to dispose of excess water. Erosion generally is not a hazard, but some areas have a large amount of runoff and need cover crops and cropland terraces for protection. (Capability unit IIw–1; woodland group 10; building site group 10)

Buchanan gravelly silt loam, 3 to 8 percent slopes (BuB).—This soil is shallower and a little better drained than the soil described as typical of the series. However, the subsoil is moderately permeable, and erosion is likely if the soil becomes saturated. Included in mapped areas are well-drained areas and a few moderately eroded areas.

This soil is suited to a cropping system consisting of a row crop, a small grain, and hay, each grown for 1 year, or to some other system of medium intensity. Suitable crops are corn, small grain, orchardgrass, and alfalfa. Areas used as cropland should be protected by cover crops, graded strips, diversion terraces, and waterways. If alfalfa is grown, a variety tolerant of moisture should be seeded. Tiling is needed in some areas of this soil. (Capability unit IIe–5; woodland group 10; building site group 10)

Buchanan very stony silt loam, 0 to 12 percent slopes (BvC).—This very stony soil has been kept in trees or pasture most of the time and, therefore, is not more than slightly eroded. Some areas, however, have been recently cleared and need practices that control erosion. These practices include seeding cover crops and using graded strips, terraces, and waterways.

This soil can be used for pasture where it is feasible to remove enough stones to permit seedbed preparation and other management. On the steeper slopes, the pasture should be seeded in graded strips to help control erosion and to dispose of surplus water. Level areas that have a seasonally high water table should not be grazed when wet. (Capability unit VIs–2; woodland group 10; building site group 10)

Catoctin Series

Soils of the Catoctin series are shallow or moderately deep and are well drained. They developed over metarhyolite, greenstone, and other basic rocks in the area of South Mountain in the western part of the county.

A moderately eroded, moderately sloping Catoctin soil that is typical of the series has a dark-brown channery silt loam surface layer about 9 inches thick. This layer has fine granular structure and rapid permeability. It is easily worked in nonstony areas. The subsoil is yellowish-brown very channery silt loam. It generally has moderate subangular blocky structure, but in many places the subsoil is only weakly developed. The subsoil generally extends to a depth of about 16 inches, but its lower part is difficult to distinguish from the substratum. The substratum is brown very channery silt loam in which fragments and weathered basic rock make up about 85 percent of the soil mass. It has strong, medium, platy structure.

Depth to bedrock ranges from 1 to 4 feet. In many places the subsoil is weakly developed.

These soils are droughty, for they are mostly shallow and have moderately low or low available moisture capacity. They range from strongly acid to slightly acid.

The Catoctin soils generally occur on the steeper slopes within areas of the deeper Highfield and Myersville soils.

A large acreage of Catoctin soils is woodland, most of which is in steep and stony areas. A part of the acreage is in bush and tree fruits, and a part is used for general farming. Yields of crops and fruit are only fair, even when management is at a high level. Yields are limited by the bedrock so near the surface.

Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded (CcB2).—This gently sloping soil is deeper than the soil described for the series. In most places the depth to the weathered material is as much as 24 inches. Included in mapped areas are more nearly level areas, less eroded areas, and severely eroded areas.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. In one suitable cropping system a row crop, a small grain, and hay are each grown for 1 year, or another system of medium intensity is used. Excessive erosion is controlled by cover crops, contour stripcropping, diversion terraces, and waterways. (Capability unit IIe–3; woodland group 11; building site group 7)

Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded (CcC2).—This is the soil described as typical of the series. Included in mapped areas are a few less eroded areas that are mostly wooded.

Drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass can be grown on this soil. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or another system of low intensity. Cover crops, contour stripcropping, diversion terraces, and waterways are needed to help control erosion and conserve moisture. (Capability unit IIIe–3; woodland group 11; building site group 8)

Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded (CcC3).—This severely eroded soil is shallower than the soil described for the series. Rock fragments and weathered basic rock are at a depth of about 13 inches. Consequently, this soil is droughty.

This soil has been cleared and used mostly for crops or orchard fruit. Even where management is high, yields of crops are generally not satisfactory, and yields of apples and peaches are only fair. This soil can be used for hay and pasture, but careful management is needed to control erosion, to conserve moisture, and to maintain organic-matter content. In areas not in pasture, only a cropping system of very low intensity should be used. One such system is 1 year of a row crop, 1 year of a small grain, and 3 or more years of hay. Suitable crops are corn, small grain, birdsfoot trefoil, and orchardgrass. This soil produces low yields of corn. Seeding should be in contour strips, and waterways should be used where needed. (Capability unit IVe–2; woodland group 14; building site group 8)

Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded (CcD2).—This soil is shallower and contains more coarse fragments than the soil described for the series. The weathered material is at a depth of only 14 inches, and the soil is droughty. Included in mapped areas are a few wooded areas that are only slightly eroded.

This soil is well suited to trees. It is not well suited to row crops, even if management is at a high level. Small grain, birdsfoot trefoil, and orchardgrass can be grown, and permanent pasture is a good use on slopes of more than 20 percent. Careful management that provides contour stripcropping, diversion terraces, and a cropping system of very low intensity is needed to control erosion, to conserve moisture, and to replenish the supply of organic matter. (Capability unit IVe–2; woodland group 11; building site group 8)

Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded (CcD3).—This steep, severely eroded soil has lost most of its original surface layer and has an exposed subsoil in places. Many gullies have formed. The weathered material is at a depth of only 10 to 12 inches, and the soil is droughty.

This soil is suited to trees and pasture, but it is very poorly suited to crops and orchard fruits. Drought-resistant varieties of birdsfoot trefoil, orchardgrass, and other plants are best for seeding pasture. If pasture is reseeded, the reseeding should be in contour strips so as to help control erosion and conserve moisture. (Capability unit VIe–2; woodland group 14; building site group 8)

Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded (CcE3).—This steep, severely eroded soil is shallower than the soil described for the series. The weathered material is generally at a depth of less than 10 inches. Many gullies have formed. Included in mapped areas are areas that are only slightly eroded and are mostly in trees.

This soil should be kept in trees or in some other cover that wildlife can use. It can be used for recreational areas. Some areas have very limited use for pasture. (Capability unit VIIe–1; woodland group 18; building site group 9)

Chewacla Series

The Chewacla series consists of somewhat poorly drained or moderately well drained soils on nearly level first bottoms that are frequently flooded. These soils are in narrow valleys in the southeastern and central parts of the county. They formed in alluvial material washed from areas underlain mostly by granite, gneiss, schist, diabase, and some quartzite.

A typical Chewacla soil has a dark-brown silt loam surface layer that is about 10 inches thick and has weak, fine, granular structure. This layer absorbs water easily and is easy to manage. The subsoil, about 38 inches thick, is sandy or gravelly loam that, in the upper part, is dark yellowish brown and of weak, fine, granular structure. In the lower part, the subsoil tends to be platy, and impeded drainage is indicated by the more gray and olive colors and by the distinct, yellowish-red mottles at a depth of about 20 inches. In some places bedrock is directly under the subsoil, but in most places there is a substratum of weathered sandy and gravelly material.

These soils vary in color and in texture, depending on the underlying material. In areas where they were derived mostly from diabase, these soils are darker colored and finer textured than they are in areas where they were derived mostly from quartzite or mica schist. These soils contain a large amount of mica where they were derived from schist and quartzite and a small amount where they were derived from diabase. The surface layer ranges from dark brown to yellowish brown, and the subsoil ranges from brownish yellow to olive brown. The surface layer is generally silt loam but ranges to loam or sandy loam. The subsoil ranges from silt loam to silty clay and is gravelly or sandy in places.

The Chewacla soils commonly occur near the Wehadkee and Rowland soils. In places they occur near the Montalto, Lehigh, and Glenelg soils. The Chewacla soils are better drained than the Wehadkee soils and are less gray throughout. They formed in finer textured material than did the Rowland soils.

Chewacla silt loam (0 to 3 percent slopes) (Ck).—This is the soil described as typical of the series. It is susceptible to flooding and scouring that cause some damage, but ordinarily floods occur only in winter and early in spring and do not last long. This soil is permeable, but its water table is seasonally high. The available moisture capacity is moderately high.

This soil is suited to a cropping system consisting of 2 years of row crops, 1 year of a small grain, and 1 year of hay, or to another system of high intensity. Suitable crops are corn, small grain, red clover, and timothy. Yields are favorable if management is good and provides for drainage and additions of fertilizer. Because drainage is the main problem of management, tile should be laid, open ditches dug, and diversion terraces constructed. Close-growing crops should be kept on this soil as much of the time as possible so that the damage caused by scouring is lessened. If crop residue is returned to the soil, it should not be disked or shredded until just before it is plowed into the soil. (Capability unit IIw–2; woodland group 2; building site group 13)

Conestoga Series

The Conestoga series consists of deep, well-drained, gently sloping to sloping soils that formed in material weathered from limestone, calcareous schist, or micaceous limestone. These soils occur in the eastern part of the county near McSherrystown and extend southwestward to Littlestown. They range from neutral to medium acid.

A moderately eroded, gently sloping Conestoga soil that is typical of the series has a pale-brown, very friable silt loam plow layer about 10 inches thick. This layer has weak, fine, granular structure, is rapidly permeable, and is easy to work. The upper subsoil is brownish-yellow silty clay loam that has weak angular blocky structure and is friable when moist and slightly sticky and plastic when wet. At a depth of about 36 inches, the subsoil is coarser textured than silty clay loam and contains partly weathered fragments of soft rock. The substratum is at a depth of 52 inches and consists of hard, coarse, impure limestone or of soft, weathered schist and fine sandy material. Hard, calcareous shale and schist is at a depth of 64 inches.

In some places the entire profile is more yellow than that of the soil described as typical of the series. The surface layer is generally silt loam, but in a few places it ranges to loam or shaly silt loam. The subsoil ranges from silty clay loam to clay loam and in places is shaly. Varying amounts of chert, schist pebbles, shale fragments and other rock occur on the surface and throughout the profile. Depth to the underlying material ranges from 40 to 70 inches.

The Conestoga soils occupy gently to moderate slopes near the shallow Hollinger soils on the steeper slopes, and near the moderately well drained Wiltshire soils on the lower slopes and in depressions. They are also near the somewhat poorly drained Lawrence soils and the poorly drained Guthrie soils.

Most of the acreage of Conestoga soils is used for crops and pasture, but a small acreage is wooded. Vegetables of high quality are grown commercially and produce favorable yields.

Conestoga silt loam, 0 to 3 percent slopes, moderately eroded (CoA2).—This soil is more nearly level than the soil described for the series. It has high available moisture capacity. Included in mapped areas are some severely eroded areas.

Suitable crops are corn, potatoes, small grain, alfalfa, and grasses. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity. Cultivation is easy and yields are satisfactory, but on slopes of more than 2 percent, contour stripcropping, supplemented with cropland terraces or diversion terraces, is needed to control severe erosion. (Capability unit IIe 1; woodland group 5; building site group 1)

Conestoga silt loam, 3 to 8 percent slopes, moderately eroded (CoB2).—This is the soil described as typical of the series. It is the most extensive Conestoga soil in Adams County. It has high available moisture capacity.

Corn, potatoes, small grain, alfalfa, and grasses are suitable crops. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity. Cultivation is easy and yields are satisfactory, if erosion is controlled. Contour stripcropping, supplemented with cropland terraces or diversion terraces, is needed to control erosion. (Capability unit IIe–1; woodland group 5; building site group 1)

Conestoga silt loam, 3 to 8 percent slopes, severely eroded (CoB3).—Erosion has removed from 3 to 6 inches of the original surface layer from this soil and in some places has exposed the subsoil. A few shallow gullies have formed.

This soil produces satisfactory yields of corn, small grain, alfalfa, and grasses if erosion is controlled, moisture is conserved, and the organic-matter content is maintained. A suitable cropping system is a row crop, a small grain, and hay, each grown for 1 year, or another system of medium intensity. Contour stripcropping, diversion terraces, and waterways are needed to control erosion. A cover crop should be seeded after spring-sown grain is harvested. Adding barnyard manure and returning crop residue to the soil help to control erosion, to conserve moisture, and to maintain organic-matter content and soil structure. (Capability unit IIIe–1; woodland group 5; building site group 1)

Conestoga silt loam, 8 to 15 percent slopes, moderately eroded (CoC2).—This strongly sloping soil is shallower to the underlying material than the soil described for the series. Sheet erosion has occurred in many places, and shallow gullies have formed in some fields. Runoff is rapid, but the available moisture capacity is high. Included in mapped areas are some areas that are only slightly eroded.

Under good management, this soil produces satisfactory yields of corn, small grain, alfalfa, and grasses. A suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 1 year of hay, or another system of medium intensity. Contour strips, diversion terraces, and waterways are needed to help control erosion and conserve moisture. A cover crop should be kept on the soil as much of the time as possible. (Capability unit IIIe–1; woodland group 5; building site group 2)

Conestoga silt loam, 8 to 15 percent slopes, severely eroded (CoC3).—This strongly sloping, severely eroded soil is shallower than the soil described for the series. More than three-fourths of the original surface layer has been removed by erosion, and many shallow gullies have formed in some fields. This erosion has reduced the organic-matter content and the available moisture capacity. Because this soil has lost much of its ability to absorb water, runoff is rapid and accelerated erosion is a serious hazard.

This soil is well suited to pasture and long-term hay, but corn and small grain can be grown in a cropping system of very low intensity. Alfalfa mixed with grasses does well. The mixture should be seeded in alternate contour strips, and diversion terraces are needed on the longer slopes. Special practices may be needed in some places to heal the existing gullies before the hay can be established. Crops can be grown in a cropping system of very low intensity that consists of 1 year of a row crop, 1 year of a small grain, and 3 or more years of hay. Narrow strips, diversion terraces, and waterways are needed to help control erosion. A plant cover should be kept on this soil as much of the time as possible. Adding manure and returning large amounts of crop residue to the soil help to conserve moisture and to maintain organic-matter content and soil structure. (Capability unit IVe–1; woodland group 5; building site group 2)

Conestoga silt loam, 15 to 25 percent slopes, severely eroded (CoD3).—This steep, severely eroded soil is shallower than the soil described for the series. Erosion has removed most of the original surface layer. The present plow layer is a mixture consisting mostly of subsoil, a little

of the original surface layer, and some manure and crop residue.

This soil is inextensive and is mostly used for pasture. Birdsfoot trefoil, orchardgrass, and bluegrass are suitable pasture plants. Although the soil is well suited to pasture, the steep slope limits the use of equipment. Reseeding should be done on the contour, and diversion terraces are needed in some places. (Capability unit VIe–1; woodland group 5; building site group 2)

Croton Series

The Croton series consists of moderately deep and deep, poorly drained soils that formed in material weathered from red and gray shale and sandstone. These soils occur in depressions, in drainageways, around the head of streams, and in other level or nearly level areas, mostly in the central part of the county (fig. 8).

Figure 8.—**A typical landscape showing an area of Croton and Readington soils. The dark-colored soil in the foreground is Croton silt loam, and the light-colored soil in the background is Readington silt loam.**

A gently sloping Croton soil typical of the series has a dark-brown silt loam surface layer about 10 inches thick. This layer has weak, medium, subangular blocky structure that breaks into fine granular structure if it is disturbed. It absorbs water readily. The lower part of the surface layer is finer textured than the upper part and contains many pores and black concretions. The subsoil is gray silty clay loam and has many, prominent, yellowish-brown mottles. It has platy structure and is hard when dry and is sticky and very plastic when wet. At a depth of about 18 inches, the subsoil is gray clay loam mottled with strong brown. Because a fragipan occurs at a depth of 18 to 36 inches, water moves through the subsoil very slowly. The substratum is at a depth of about 45 inches and consists of dark-red fragments of shale in a silty clay loam matrix that is mottled with gray. Depth to bedrock ordinarily is about 4½ feet but ranges from 3 to 6 feet.

The surface layer is gray or brown and generally ranges from silt loam to silty clay loam. It ranges from loam to sandy loam in areas near the Steinsburg and Lansdale soils. The subsoil ranges from silty clay loam to light clay loam. It is generally gray mottled with yellow or is yellow mottled with gray, depending on the color of the underlying material. The depth to mottling ranges from a few inches to 14 inches. A few areas are covered with several inches of alluvial material.

These soils are normally strongly acid, but they are only slightly acid in areas influenced by limestone and diabase. Natural fertility is fairly low, and the available moisture capacity is moderately high.

The Croton soils occur near the well drained Penn and Lansdale soils, the moderately well drained Readington soils, and the somewhat poorly drained Abbottstown soils. They are also near the shallow Klinesville, Steinsburg, and Reaville soils, and in some places are near the Brecknock and Lehigh soils.

The Croton soils are extensive in Adams County. They are intermingled with some of the better drained and productive soils and are important to the agriculture of the county. If drained, they can be used for some of the crops commonly grown in the county. Suitable crops are corn, wheat, and moisture-tolerant varieties of grasses and legumes. These soils are not suited to winter oats, barley, potatoes, or alfalfa. They are difficult to drain; tile drains generally are not effective, because the subsoil is moderately fine textured. The soils will puddle and compact if worked, grazed, or driven over when wet.

Croton silt loam, 0 to 3 percent slopes (CrA).—The profile of this soil is the one described for the series. The subsoil is slowly permeable, and the water table is high for much of the year. Erosion is not likely. Included in mapped areas are moderately eroded areas that have a finer textured surface layer.

If properly drained, this soil is suited to corn, red clover, ladino clover, and timothy. A suitable cropping system is a row crop, a winter grain, and 3 or more years of hay or pasture, or some other system of very low intensity. Drainage can be improved by bedding and open ditches. Tile drains generally are not effective. Water from higher areas can be kept from accumulating by constructing diversion terraces. (Capability unit IVw–1; woodland group 13; building site group 12)

Croton silt loam, 3 to 8 percent slopes, moderately eroded (CrB2).—This gently sloping, moderately eroded soil is shallower than the soil described for the series. Water seeps from adjoining slopes in some places. This soil remains wet until late in the spring. Included in mapped areas are small severely eroded, steeper areas and fairly large slightly eroded, wooded areas.

Although there has been some erosion, wetness is the main limitation. Graded stripcropping, diversion terraces, and waterways are needed to dispose of excess water and to control erosion. Bedding and tile drains can be used in some places. Open ditches are beneficial in some areas.

If this soil is drained and erosion is controlled, it is suited to corn, red clover, ladino clover, and timothy. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or some other system of low intensity. This soil is not well suited to winter oats, barley, alfalfa, or root crops. It will puddle and compact if plowed or

grazed when wet. If trees are planted, a moisture-tolerant species should be used. (Capability unit IVw–2; woodland group 13; building site group 12)

Dunning Series

The Dunning series consists of very poorly drained soils on nearly level flood plains. These soils formed in material that washed from uplands underlain by limestone and other calcareous rocks. They lie along streams in the Fairfield Valley and in the limestone areas near McSherrystown in the eastern part of the county.

A Dunning soil typical of the series has a silty clay loam surface layer that has platy structure and, in the top 5 inches, is very dark gray mottled with olive gray and dark yellowish brown. The surface layer is difficult to work because it is very sticky and very plastic when wet and is very hard when dry. A seedbed is difficult to prepare because the soil clods when it is plowed. The subsoil is very dark-gray silty clay in the upper part and is gravelly silty clay loam at about 37 inches below the surface. Many dark yellowish-brown and olive-gray streaks occur in the subsoil.

The Dunning soils range from black to dark grayish brown and from gray to olive. The subsoil ranges from silty clay to clay. In some places where the alluvium was recently deposited, the top few inches of this soil is not mottled. The subsoil is as much as 5 feet thick and, in places, is stratified with gravel in the lower part.

The Dunning soils are near the poorly drained Melvin soils and the moderately well drained Lindside soils but have finer texture and are wetter than those soils.

Unless these soils are adequately drained, they are too wet for cropping but may be used for pasture if the grazing is carefully controlled.

Dunning silty clay loam (0 to 3 percent slopes) (Du).—This is the soil described for the series. It is slightly acid or neutral. The available moisture capacity is moderate to high, and there is no erosion hazard. This soil is very slowly permeable and has a high water table most of the year.

Wetness is the main limitation, but drainage is difficult. Open ditches and bedding are generally the best means of drainage, because the clayey subsoil makes drainage by tile impractical. Water from higher areas can be kept from accumulating by placing diversion terraces at the base of slopes. Flooding seldom occurs during the growing season.

If drainage is maintained, this soil is fairly well suited to corn, red clover, ladino clover, timothy, and other crops. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or some other system of low intensity. (Capability unit IVw–1; woodland group 4; building site group 13)

Edgemont Series

The Edgemont series consists of deep and moderately deep, well-drained soils that formed in material weathered mostly from quartzite. Most areas of these soils are on moderately sloping to steep ridges in the extreme northern and western parts of the county. A small area occurs in the area of Pigeon Hills in the extreme eastern part of the county.

A typical Edgemont soil in a wooded area has a surface layer of very dark grayish-brown loam about 1 inch thick. This layer is underlain by about 8 inches of yellowish-brown loam or channery loam that is friable, is strongly acid, and has granular structure. In many places quartzite boulders are on the surface. The amount of fragmented rock on the surface and throughout the profile varies greatly but, in most places, increases with depth. The subsoil is yellowish-brown clay loam that is friable and has subangular blocky structure. At a depth of 30 to 60 inches, fragmented quartzite makes up about 85 percent of the soil mass.

The surface layer ranges from dark grayish brown to dark yellowish brown in color and from loam to channery loam, or from loam to silt or sandy loam, in texture. The subsoil ranges from light yellowish brown to strong brown and is silty clay loam or clay loam.

These soils are strongly acid or very strongly acid and are moderate to low in natural fertility. They are moderate to high in available moisture capacity.

Edgemont soils are coarser textured and contain less rock than the nearby Highfield soils. Edgemont soils are not so red nor so gravelly as the Myersville soils and are deeper and contain more fragments of quartzite than the Catoctin soils.

Most areas of these soils have remained wooded and have not eroded, but cleared areas are moderately eroded or severely eroded.

Edgemont channery loam, 3 to 8 percent slopes (EcB).—This is the soil described for the series. It has a small total acreage, most of which is on narrow ridgetops. Some areas are moderately eroded.

Practically all of this soil is covered with hardwoods, but areas could be cleared and cultivated. This soil is suited to crops commonly grown in the county. If large amounts of lime and fertilizer were added, favorable yields would be produced. A suitable cropping system is 2 years of a row crop, 1 year of a small grain, and 1 year of hay. Farm machinery would be difficult to use on this soil because areas are small, and the surrounding ridges are steep and stony. (Capability unit IIe–2; woodland group 8; building site group 1)

Edgemont channery loam, 8 to 15 percent slopes (EcC).—This moderately deep, well-drained soil occurs on some of the longer, less steep ridges and is practically all wooded. Included in mapping are small moderately eroded areas and small severely eroded areas.

If this soil were cleared, it would be suited to orchard fruits and to farm crops commonly grown in the county. A suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 1 year of hay or pasture, but strip-cropping and diversion terraces are needed to control erosion. Also needed are additions of lime and fertilizer. (Capability unit IIIe–2; woodland group 8; building site group 2)

Edgemont channery loam, 15 to 25 percent slopes, moderately eroded (EcD2).—This soil has a profile similar to the one described for the series, but erosion has removed 3 or 4 inches of the original surface soil. In most places the tree cover has been destroyed or thinned by timber cutting or forest fires. This soil is more susceptible to erosion than most other Edgemont soils. Included in mapping are a few slightly eroded areas and a few severely

eroded areas. A few included areas are more sandy than channery loam.

If this soil is cultivated, the most intensive cropping system that can be used is a row crop, a small grain, and 3 or more years of hay or pasture. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, diversion terraces, grassed waterways, and other practices help to conserve moisture and control erosion. Slopes of more than 20 percent are suited to pasture. Yields of fruit are fair to good on this soil. (Capability unit IVe-1; woodland group 8; building site group 2)

Edgemont very stony loam, 0 to 8 percent slopes (EhB).—This soil has more stones and boulders on the surface and throughout the profile than the soil described as typical of the series. Stones, boulders, and fragments of quartzite cover from 15 to 75 percent of the surface. Between stones the soil material is porous and permeable to roots, water, and air.

Because of the stones, this soil is unsuitable for cultivated crops. It is suited to trees. Favorable yields of orchard fruits and pasture can be obtained if enough stones are removed to permit proper management. A mixture of birdsfoot trefoil and orchardgrass or bluegrass is suitable for pasture, but the mixture should be seeded in contour strips so that erosion is controlled and moisture is conserved. In orchards, the trees should be planted on the contour, and cover crops or permanent sod should be maintained between the trees. (Capability unit VIs–1; woodland group 8; building site group 5)

Edgemont very stony loam, 8 to 25 percent slopes (EhD).—More stones and boulders are on and in this soil than are on and in the soil described for the series. Erosion is slight, for the cover of trees and stones has protected the soil from the rapid and medium runoff. The stones, however, make clearing difficult. If this soil were cleared, the hazard of erosion would be moderate or severe unless practices to control erosion were intensive. This soil is well suited as woodland and should be managed to improve the stands of trees. (Capability unit VIs–1; woodland group 8; building site group 6)

Edgemont very stony loam, 25 to 70 percent slopes (EhE).—This steep and very steep soil has many more stones and boulders on and in it than has the soil described for the series. The soil is too steep and stony for any practical use other than woodland or recreation. Runoff is rapid, but the stones and trees have kept erosion to a minimum. Included in mapped areas, however, are areas of severely eroded soils. (Capability unit VIIs–1; woodland group 9; building site group 9)

Glenelg Series

The Glenelg series consists of deep, well-drained, medium-textured soils. These soils formed over phyllite and schist. They occur in the extreme southeastern part of the county in gently rolling areas and on fairly broad ridgetops.

A soil typical of the Glenelg series has a dark-brown silt loam plow layer about 7 inches thick. This layer has fine, granular structure, is friable, and absorbs water readily. It is channery in places. The subsoil is silt loam that has subangular blocky structure, is slightly sticky and slightly plastic when wet, and generally is acid. The upper part of the subsoil is strong brown, and the lower part is yellowish red. Fragments of rock occur in the profile and increase in amount with depth. At a depth of about 12 inches the soil material is shaly, and at 21 inches it is very shaly. The substratum, at a depth of 26 inches, is very shaly, micaceous loam that has little structure.

The subsoil ranges from silt loam to silty clay loam and in places contains few to many mica flakes. The Glenelg soils are commonly moderately deep to weathered micaceous material and deep to bedrock.

These soils are permeable and have moderately high available moisture capacity. Tilth is generally good, but eroded areas tend to be thin and droughty.

The Glenelg soils occur near the shallower Manor soils, which are on breaks of steeper slopes. They are also in depressions near the moderately well drained Glenville soils and the poorly drained Worsham soils.

Most of the acreage is used for crops, but a few of the steeper and stony areas are small woodlots.

Glenelg silt loam, 0 to 3 percent slopes (GcA).—This soil is more nearly level than the soil described for the series, but it is like that soil in other respects. Included in areas mapped as this soil are small moderately eroded areas.

This soil is suited to a cropping system of very high intensity in which corn, potatoes, bush fruits, small grain, and alfalfa may be grown.

On the steeper slopes contour farming will help to conserve moisture and to control erosion (fig. 9). Areas in bush fruits should be mulched or seeded to a winter cover crop to conserve moisture and to help maintain organic-matter content and soil structure. (Capability unit I–1; woodland group 11; building site group 5)

Glenelg silt loam, 3 to 8 percent slopes, moderately eroded (GcB2).—This is the soil described as typical of the series. Because it is only moderately deep to the weathered underlying material, it tends to dry out faster than the

Figure 9.—Lima beans on Glenelg silt loam in the southeastern corner of Adams County. Contour farming helps to control erosion.

deeper soils. Included in areas mapped as this soil are a few severely eroded areas and a few uneroded wooded areas.

This soil is suited to corn, potatoes, bush fruits, small grain, alfalfa, and orchardgrass. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity. A cover crop should be seeded after the row crop is harvested. Contour strips, supplemented with cropland terraces or diversion terraces, are generally needed so that excess water is disposed of and erosion is controlled. Mulching areas in bush fruits, or seeding a winter cover crop, helps to control erosion, to maintain structure, and to conserve moisture. Satisfactory yields of apples, peaches, and cherries may be obtained if the orchards are carefully managed. (Capability unit IIe–2; woodland group 11; building site group 5)

Glenelg silt loam, 8 to 15 percent slopes (GcC).—This strongly sloping soil occupies only a small acreage in the county. Its surface layer is thicker and darker colored than that of the soil described for the series.

This soil is suited to corn, small grain, bush fruits, alfalfa, and orchardgrass. A suitable cropping system consists of 1 year of a row crop, 1 year of a small grain, and 1 year of hay, or some other system of medium intensity. Contour stripcropping, supplemented with diversion terraces and waterways, is generally needed to control erosion and to conserve moisture. Yields of apples, cherries, and peaches are adequate if the management of orchards is at a high level. (Capability unit IIIe–2; woodland group 11; building site group 6)

Glenelg silt loam, 8 to 15 percent slopes, moderately eroded (GcC2).—This moderately deep, strongly sloping soil is more susceptible to erosion than the soil described for the series. It tends to be droughty in especially dry summers. Included in mapped areas are a few severely eroded areas.

This soil is suited to a cropping system of medium intensity in which corn, small grain, bush fruits, alfalfa, and orchardgrass may be grown. A suitable cropping system is a row crop, a small grain, and hay, each grown for 1 year. Contour stripcropping, diversion terraces, and waterways are generally needed to control erosion. Satisfactory yields of apples, peaches, and cherries may be obtained if management of orchards is at a high level. (Capability unit IIIe–2; woodland group 11; building site group 6)

Glenville Series

Soils of the Glenville series are deep and moderately well drained. They developed from weathered schist and phyllite, a considerable amount of which washed in from higher soils. Glenville soils occur in the extreme southeastern part of the county in level to gently sloping areas and in drainageways.

A soil typical of the Glenville series has a dark-brown silt loam plow layer about 9 inches thick. This layer has weak, fine, granular structure, is very friable when moist, absorbs water readily, and is easy to work. The plow layer is underlain by dark-brown silt loam that tends to have somewhat subangular blocky structure. At a depth of 18 to 23 inches, the subsoil is yellowish-brown silty clay loam that has a few, fine, yellowish-brown mottles. The mottles increase in number with depth. A moderately expressed sticky, plastic fragipan is at a depth of 23 to 40 inches. At a depth of 33 inches, the subsoil is brownish-yellow shaly silty clay loam that has prismatic structure breaking to fine platy structure. The substratum, at a depth of 40 inches, is 85 percent schist fragments.

In some areas the surface layer is much thinner than that of the soil described. The subsoil is silty clay loam to fine silt loam. The depth to mottling is ordinarily at about 18 inches but ranges from 15 to 36 inches.

These soils are medium acid to strongly acid in most places, but many areas that have received deposits from fertilized fields are less acid and more productive than normal. These soils have moderately slow permeability. Tilth is generally good, and the available moisture capacity is moderately high to high. These soils remain wet later in spring than do the surrounding soils at the higher elevations.

The Glenville soils occur between areas of the poorly drained Worsham soils and of the well-drained Glenelg and Manor soils.

The Glenville soils are not extensive in Adams County. They are easy to work and, under good management, produce satisfactory yields of corn, orchardgrass, and other crops. They are not well suited to alfalfa, winter grain, or root crops.

Glenville silt loam, 0 to 3 percent slopes (GnA).—This soil is more nearly level than the soil described for the series. Included in areas mapped as this soil are some moderately eroded areas.

This soil is suited to a cropping system consisting of 2 years of row crops, 1 year of a small grain, and 1 year of hay, or to another system of high intensity. Corn and orchardgrass are suitable crops. If drained, this soil is suited to tomatoes, potatoes, and winter grain. Alfalfa grows fairly well in the more sloping areas if crop varieties tolerant of wetness are seeded. Artificial drainage, especially in the more nearly level areas, is needed. Tile drains can be used in most areas. In areas where seeps occur at the foot of the steeper slopes, diversion terraces are helpful in carrying away excess water. Bedding is beneficial in some areas, and graded rows work well in the gently sloping areas. (Capability unit IIw–1; woodland group 10; building site group 10)

Glenville silt loam, 3 to 8 percent slopes (GnB).—This is the soil described for the series. Included in areas mapped as this soil are eroded areas and areas with slopes of more than 8 percent.

A suitable cropping system is a row crop, a small grain, and hay, each grown for 1 year, or another system of medium intensity. Suitable crops are corn and orchardgrass. Drained areas are suited to tomatoes, potatoes, and winter grain. Moisture-tolerant varieties of alfalfa can be grown, but most of the deep-rooted crops are not well suited. Graded stripcropping, diversion terraces, and waterways may be needed to control erosion, and in some areas random tile and surface ditches are needed for drainage. (Capability unit IIe–5; woodland group 10; building site group 10)

Guthrie Series

The Guthrie series consists of deep, poorly drained soils that formed in material weathered from limestone and cal-

careous schist. These soils occur mostly in level areas and in depressions throughout the limestone areas of Adams County. A few areas are in the Fairfield Valley, but the largest areas are near McSherrystown.

A soil typical of the Guthrie series has a dark-gray silt loam surface layer that has common, dark-brown mottles and is about 10 inches thick. This layer is sticky and plastic when wet and is hard when dry. It is generally difficult to work. The subsoil is olive-gray silty clay that is very sticky and very plastic when wet. At a depth of 16 inches is a fragipan that is firm and has platy structure. The substratum occurs at a depth of 45 inches. It consists of brown, very gravelly, gritty silty clay loam that weathered from limestone conglomerate or other calcareous material and is about 70 percent fine gravel.

The surface layer generally is silt loam, but it ranges to silty clay loam in some places. The subsoil ranges from clay to clay loam.

The Guthrie soils are near the better drained and lighter colored Lawrence, Readington, Conestoga, and Hollinger soils. They are also near the well-drained Athol soils in Fairfield Valley and the Melvin and Dunning soils, which are on flood plains.

Guthrie silt loam (0 to 3 percent slopes) (Gu).—Only this Guthrie soil is mapped in Adams County, but some areas of silty clay loam are included in mapped areas. Most areas of this soil are in depressions and are surrounded by better drained soils. In spring the plowed areas of this soil can be spotted from a distance because their surface is contrastingly dark. Tilth is very poor in many places. This soil has a slowly permeable subsoil and is very slow to dry in spring. Wetness is a severe hazard. Many areas are so small that they are cultivated in the same way as are the adjacent, better drained soils. Plowing, however, compacts this soil and destroys its structure. Also, puddling occurs, and soil material sticks to the farm machines.

This soil is well suited to pasture, and moisture-tolerant grasses and legumes should be seeded. Corn, winter grain, red clover, ladino clover, and timothy can be grown in the larger, sloping areas if drainage is improved. A suitable cropping system is 1 year of a row crop and 2 years or more of hay, or another system of low intensity. Yields are generally low. Drainage can be improved by bedding, by surface ditches, and in some places, by random tile. Tile drains generally are not practical, because the subsoil is slowly permeable and many areas have no drainage outlets. Diversion terraces may be needed to help control runoff from adjoining slopes. (Capability unit IVw–1; woodland group 13; building site group 12)

Highfield Series

Soils of the Highfield series are deep and well drained. They formed in material weathered from metarhyolite and other basic rocks in the western and extreme eastern parts of the county. In the western part they are in the area of South Mountain and Piney Mountain, and in the eastern part they are in the area of Pigeon Hills. Figure 10 shows an area of Highfield soils.

A typical gently sloping Highfield soil has a dark grayish-brown channery silt loam surface layer about 10 inches thick. This layer is granular, absorbs water readily, and is friable when moist and slightly plastic when wet. The subsoil is yellowish-brown channery silt loam that has weak subangular blocky structure and is friable when moist and somewhat sticky and plastic when wet. Fragments of rock increase in number with depth, and at 30 inches the subsoil is channery. At a depth of 39 inches, the substratum is reddish gray and consists of weathered rock fragments in a silt loam matrix. The fragments make up 95 percent of the soil material.

Figure 10.—Highfield soils on slopes that range from 3 to 15 percent.

The profile ranges from yellowish brown to pinkish white and has a purple cast in some places. The subsoil ranges from silt loam to silty clay loam. Depth to bedrock ranges from 3 to 6 feet or more. Some areas are very stony and are mapped separately in this county.

The Highfield soils occur near the redder Myersville soils and the shallow Catoctin soils. In places they are near the Arendtsville and Montalto soils.

Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded (HcA2).—This soil is more nearly level than the soil described for the series, but the profiles of the two soils are similar. It is permeable and has moderately high available moisture capacity. A few areas mapped as this soil are uneroded or only slightly eroded.

Suitable crops are corn, potatoes, bush and tree fruits, small grain, alfalfa, and orchardgrass. Cultivation is easy, though in some places the rock fragments do interfere. A cropping system of high intensity can be followed. One such system is 2 years of row crops, 1 year of a small grain, and 1 year of hay. On slopes of more than 2 percent, stripcropping is desirable. On long slopes diversion terraces or cropland terraces and waterways may be needed.

To conserve moisture and soil, orchards can be kept in permanent sod, or cover crops can be planted and trashy cultivation used. Bush fruits should be mulched or protected by winter cover crops to help control erosion, maintain soil structure, and conserve moisture. (Capability unit IIe–2; woodland group 5; building site group 1)

Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded (HcB2).—This soil is permeable and has high available moisture capacity. Mapped areas include a few severely eroded areas and a few uneroded wooded areas.

Suitable crops are corn, potatoes, bush and tree fruits, small grain, alfalfa, and orchardgrass. A suitable cropping system is 2 years of row crops and a cover crop, 1 year of a small grain, and 1 year of hay, or another system of high intensity. Contour stripcropping, supplemented by cropland terraces or diversion terraces, may be needed to control severe erosion and conserve moisture.

Orchards should be kept in permanent sod or cover crops, and trashy cultivation should be used to conserve moisture and maintain soil structure. Bush fruits should be mulched or planted to winter cover crops to help control erosion, maintain soil structure, and conserve moisture. (Capability unit IIe–2; woodland group 5; building site group 1)

Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded (HcC2).—This soil is steeper than the soil described for the series, but the profiles of the two soils are similar. This soil is permeable and has moderately high available moisture capacity. Included in mapped areas are uneroded or slightly eroded areas, most of which are wooded.

Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. A suitable cropping system is corn, a small grain, and hay, each grown for 1 year, or another system of medium intensity. Contour stripcropping, supplemented with diversion terraces and waterways, is needed to control erosion and to conserve moisture.

Orchards should be kept under permanent sod or cover crops, and trashy cultivation is needed for conserving soil and moisture. Diversion terraces are needed on the longer slopes so that water can be managed efficiently. For bush fruits, mulching and the protection of cover crops are required to control erosion, maintain soil structure, and conserve moisture. (Capability unit IIIe–2; woodland group 5; building site group 2)

Highfield channery silt loam, 8 to 15 percent slopes, severely eroded (HcC3).—This soil is steeper and more severely eroded than the soil described for the series, but the profiles of thetow soils are similar. Subsoil material has been mixed with the plow layer in this eroded soil. The moisture that plants can use has been reduced by the erosion. Permeability is moderate.

Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. A suitable cropping system is a row crop, a small grain, and 3 or more years of hay, or another system of very low intensity. Contour strips, supplemented with diversion terraces and waterways, are necessary for controlling erosion and conserving moisture. Orchards should be kept in permanent sod, and bush fruit fields should be protected by a mulch or by a winter cover crop. (Capability unit IVe–1; woodland group 5; building site group 2)

Highfield channery silt loam, 15 to 25 percent slopes (HcD).—This soil is much steeper than the soil described for the series, but the profiles of the two soils are similar. A cover of trees has protected this soil from erosion. Permeability is moderate, and available moisture capacity is moderately high. Mapped with this soil are some moderately eroded areas.

On slopes of less than 20 percent, areas of this soil are suited to crops, but steeper areas should be used as pasture or woodland. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. Because erosion is likely, a cropping system of very low intensity should be used. One such system is a row crop, a small grain, and 3 or more years of hay and pasture.

Care should be taken to keep a plant cover on the soil as much of the time as possible. Contour stripcropping, supplemented with diversion terraces and waterways, is needed for disposing of excess water and controlling erosion. Fruit trees should be kept in permanent sod. Needed to protect fruit bushes is a mulch or a winter cover crop. (Capability unit IVe–1; woodland group 5; building site group 2)

Highfield channery silt loam, 15 to 25 percent slopes, severely eroded (HcD3).—This severely eroded soil is much steeper than the soil described for the series, but the profiles of the two soils are somewhat similar. The plow layer of this soil is lighter colored because subsoil material has been mixed into it. Erosion has caused a loss of organic matter and a reduction of available moisture capacity.

This soil is suitable for orchards or for pasture on which grazing is limited. If management is at a high level, satisfactory yields of apples are produced but yields of cherries and peaches are only fair. Birdsfoot trefoil, orchardgrass, or bluegrass should be used for seeding pasture. Any reseeding that is done should be in contour strips, and diversion terraces and waterways should be used with the contour strips to assist in control of erosion and management of water. A permanent sod is needed in orchards. (Capability unit VIe–3; woodland group 5; building site group 2)

Highfield and Catoctin very stony loams, 0 to 8 percent slopes (HhB).—These very stony soils were mapped together because they occur together and the stones outweigh all other properties that affect management. Showing these soils separately on the soil map would serve no useful purpose.

So many stones and boulders are on the surface and throughout the profile that cultivation is not practical. Most areas of these soils are wooded and are not eroded. Satisfactory yields of fruit and of pasture plants could be produced, but clearing away the stones, boulders, and trees is very expensive. If enough stones could be removed to permit the seeding of grasses and legumes and the managing of the pasture, these soils would produce satisfactory yields of forage. (Capability unit VIs–1; woodland group 11; building site group 5)

Highfield and Catoctin very stony loams, 8 to 25 percent slopes (HhD).—These very stony soils were mapped together because the stones outweigh all other properties that affect management, and mapping the soils separately would serve no useful purpose. The soils are in the northwestern part of the county.

So many stones and boulders are on the surface and throughout the profile that cultivation is not practical. Most of the acreage is wooded and generally is not eroded. Good fruit and fair pasture could be produced if the stones were removed and the trees cleared, but this operation is very expensive. (Capability unit VIs–1; woodland group 11; building site group 6)

Highfield and Catoctin very stony loams, 25 to 70 percent slopes (HhE).—These very stony, very steep soils were mapped together because their stoniness and steepness outweigh all other properties that affect management, and mapping the soils separately would serve no useful purpose. These soils are in the northwestern part of Adams

County. Most of the acreage is wooded and generally not eroded. Because of the severe limitations, wooded areas should be kept in trees, and cleared areas should be planted to trees. (Capability unit VIIs–1; woodland group 15; building site group 9)

Hollinger Series

The Hollinger series consists of shallow and moderately deep, well-drained soils that formed in material weathered from limestone and calcareous schist. These soils occur as small areas on steep breaks and on a few moderately sloping hillsides in the limestone area near McSherrystown.

A soil typical of the Hollinger series has a yellowish-brown silt loam plow layer about 7 inches thick. This layer has fine granular structure and is very friable when moist. The subsoil is about 9 inches thick and consists of strong-brown to brownish-yellow silt loam that is channery in the lower 3 inches. This layer has subangular blocky structure that breaks to fine granular structure. It is friable when moist and slightly sticky and slightly plastic when wet. At a depth of 16 inches, the substratum consists of soft weathered limestone.

In many areas the surface layer and the subsoil are redder than those of the soil described. The subsoil is silt loam or silty clay loam and is shaly in some places. Depth to hard, calcareous rock ranges from 12 to 24 inches.

These soils are permeable, slightly acid or neutral, and susceptible to erosion. Because they are shallow, they are droughty in dry periods.

The Hollinger soils occur near the deeper Conestoga soils, the less well drained Wiltshire and Lawrence soils, and the poorly drained Guthrie soils.

The Hollinger soils are not extensive in Adams County. Most of their acreage is used for crops, but small areas are wooded.

Hollinger silt loam, 3 to 8 percent slopes, moderately eroded (HoB2).—This is the soil described for the series. Included in mapping are a few slightly eroded areas, severely eroded areas, and areas that have slopes of less than 3 percent.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, orchardgrass, and other crops. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or some other system of low intensity. Cover crops, contour stripcropping, diversion terraces, and waterways are needed to control erosion and conserve moisture. (Capability unit IIe–4; woodland group 11; building site group 7)

Hollinger silt loam, 8 to 15 percent slopes, severely eroded (HoC3).—This soil is steeper and more strongly eroded than the soil described for the series, but otherwise, the profile of the two soils is the same. Material from the subsoil of this severely eroded soil has been mixed into the plow layer. A few areas are only moderately eroded.

Suitable crops are corn, small grain, birdsfoot trefoil, red clover, and orchardgrass. These crops can be grown in a cropping system of very low intensity consisting of a row crop, a small grain, and 3 or more years of hay. Careful management is needed to control further erosion, to conserve moisture, and to maintain organic-matter content. Contour strips, supplemented with diversion terraces and waterways, help to control erosion and to conserve moisture. (Capability unit IVe–3; woodland group 14; building site group 8)

Hollinger silt loam, 15 to 25 percent slopes, severely eroded (HoD3).—This soil has more rapid runoff than the soil described for the series, and it has lost more of its original surface layer. Also, the present surface layer is lighter colored, for more material from the subsoil has been mixed into it. The available moisture capacity is low. Included in mapping are a few areas that are not severely eroded and a few areas with slopes of more than 25 percent.

This soil is not suited to cultivated crops or hay, but it can be used for pasture if grazing is controlled. Suitable pasture plants are birdsfoot trefoil, orchardgrass, and bluegrass. Reseeding should be done in contour strips that are supplemented, where needed, with diversion terraces. Because this soil is droughty and susceptible to erosion, careful management is needed to control erosion, increase organic-matter content, and conserve moisture. (Capability unit VIe–1; woodland group 14; building site group 8)

Klinesville Series

The Klinesville series consists of well-drained soils that are shallow or very shallow to the hard, purplish-red or dark-red shale and sandstone from which they were derived. These soils occur on sharp breaks and on moderate to gentle slopes throughout the central part of Adams County.

A soil typical of the Klinesville series has a reddish-brown shaly silt loam plow layer about 8 inches thick. About 30 percent of this layer is made up of fragments of shale. The surface layer has rapid permeability and is very friable when it is moist. It is not sticky or plastic when it is wet, and generally it can be cultivated soon after a rain. The material underlying the surface layer is about 50 percent shale fragments, but in other respects this material is similar to that of the surface layer. Weak-red, hard shale occurs at a depth of about 14 inches.

In some areas the surface layer contains a larger or smaller amount of shale than does that of the soil described. In many parts of Adams County, the Klinesville soils have a very shaly B horizon. This horizon is weakly developed and may be 10 inches thick in some places, but it is discontinuous in other places. The surface layer and the subsoil range from reddish brown to reddish yellow, but the subsoil is redder at the lower depths near the hard shale. Depth to hard shale ranges from 5 to 30 inches.

The Klinesville soils occur near the moderately deep Penn and Lansdale soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. In places the Klinesville soils are near the sandy Steinsburg soils and the somewhat poorly drained Reaville soils.

Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded (KsA2).—This soil is deeper to hard shale than the soil described for the series, and it is less likely to erode when farmed. It is shallow, permeable, droughty, and medium acid or strongly acid. A few areas are only slightly eroded, but in a few areas erosion has removed about three-fourths of the original surface layer.

This soil is suited to corn, drought-resistant varieties of winter grain, birdsfoot trefoil, and orchardgrass. If

management is at a high level, satisfactory yields of alfalfa are produced in some areas. Crops can be grown in a cropping system of low intensity that consists of a row crop, a small grain, and 2 years of hay. Conserving moisture and maintaining the organic-matter content are the main problems of management. Contour stripcropping, supplemented with diversion terraces and waterways, is needed in the more sloping areas. (Capability unit IIIe–4; woodland group 14; building site group 7)

Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded (KsB2).—This is the soil described as typical of the series. It is shallow, permeable, droughty, and medium acid or strongly acid. A few mapped areas are only slightly eroded, but in some areas erosion has removed as much as three-fourths of the original surface layer.

This soil is suited to a cropping system that consists of a row crop, a small grain, and 2 years of hay, or to another system of low intensity. Drought-resistant varieties of winter grain, birdsfoot trefoil, and orchardgrass are best suited. Corn can be included in the cropping system, but yields are low. If management is at a high level, adequate yields of alfalfa can be obtained. Intensive practices should be used to conserve moisture, to maintain organic-matter content, and to control further erosion. Contour stripcropping, supplemented with diversion terraces and waterways, may be needed in some areas. (Capability unit IIIe–4; woodland group 14; building site group 7)

Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded (KsB3).—Erosion has removed three-fourths of the original surface layer from this soil and in many areas has cut shallow gullies in which beds of shale are exposed in places. Most areas are very shaly. This soil is permeable, shallow, droughty, and medium acid or strongly acid.

This soil is better suited to pasture than to row crops if grazing is controlled and drought-resistant varieties of pasture plants are seeded. Crops and hay can be grown in a cropping system of very low intensity. One such system is 1 year of a small grain and 3 or more years of hay. Suitable crops are small grain, birdsfoot trefoil, and orchardgrass. Seeding should be done in contour strips that are protected by diversion terraces and grassed waterways on long slopes. Careful management is needed to control erosion, to conserve moisture, and to maintain the organic-matter content. (Capability unit IVe–2; woodland group 17; building site group 7)

Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded (KsC2).—This moderately eroded soil is steeper than the soil described for the series, but the profiles of the two soils are similar. This soil is permeable, shallow, droughty, and medium acid or strongly acid. In many areas as much as three-fourths of the original surface soil has been removed.

Although this soil is well suited to pasture, grazing should be controlled and drought-resistant plants should be seeded. A suitable cropping system is a small grain and 3 or more years of hay, or some other system of very low intensity. Suitable crops are small grain, birdsfoot trefoil, and orchardgrass. Corn can be included in the cropping system, but yields are low. Seeding should be done in contour strips, and diversion terraces and grassed waterways are needed on the longer slopes. Also needed is careful management that will conserve moisture, maintain organic-matter content, and control erosion. (Capability unit IVe–2; woodland group 14; building site group 8)

Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded (KsC3).—This strongly sloping, severely eroded soil is shallower than the soil described for the series. Erosion has removed more than three-fourths of the original surface layer and has cut many shallow gullies in which hard, red shale is exposed in many places. This soil is permeable, droughty, and medium acid or strongly acid.

This soil is not suited to crops or hay. It can be used for pasture if intensive practices are used to control erosion, conserve moisture, and maintain organic-matter content. The pasture should be seeded to birdsfoot trefoil, orchardgrass, or other drought-resistant plants. Reseeding should be in contour strips to help control erosion and conserve moisture until the plants are well established. Pastures should not be overgrazed or grazed early in spring. (Capability unit VIe–2; woodland group 17; building site group 8)

Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded (KsD3).—This severely eroded, steep soil is shallower to bedrock than the soil described for the series. Erosion has removed most of the original surface soil and has cut many gullies into the hard shale. Most areas are shaly. This soil is medium acid or strongly acid. Included in mapped areas are a few areas that are only moderately eroded, some areas of severely eroded Penn soils, and a few areas of Reaville soils.

This soil is not suited to crops or pasture, and it should be kept in trees or other permanent cover. Intensive management is needed to control erosion. (Capability unit VIIe–1; woodland group 17; building site group 8)

Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded (KsE3).—Erosion has removed more than three-fourths of the original surface layer from this soil and, in many places, has cut gullies into the hard shale. This soil is permeable, shallow, droughty, and medium acid or strongly acid. Its organic-matter content and available moisture capacity are low. Included in mapped areas are a few areas of Klinesville soils that are only moderately eroded and a few areas that have slopes of more than 35 percent. Also included are a few areas of Penn soils having slopes of 25 percent or more and some steep areas of Reaville shaly silt loam.

This soil is not suited to crops or pasture and should be kept in trees or other permanent cover. (Capability unit VIIe–1; woodland group 18; building site group 9)

Lamington Series

The Lamington series consists of deep, poorly drained or somewhat poorly drained soils that formed on old terraces in material weathered from red shale and sandstone. These nearly level or gently sloping soils are above the flood plains along the larger streams of the county.

A soil typical of the Lamington series has a silt loam surface layer about 11 inches thick. The top inch is dark brown, has fine subangular blocky structure, and is very friable when moist. Between depths of 1 and 6 inches, the surface layer is dark grayish brown, has common,

faint, red mottles, is slightly sticky and plastic when wet, and has fairly platy structure. It is firm when moist and sticky and plastic when wet. The surface layer is light gray below a depth of 6 inches. The subsoil is silty clay loam in the upper part and cobbly clay loam below a depth of 16 inches. At a depth of about 3 feet is the substratum of mottled gray cobbly clay loam. It contains many black concretions and is sticky and plastic when wet. Cobblestones and pebbles make up 40 percent or more of the substratum.

Throughout the profile, color ranges from dark brown to gray or reddish brown and the content of pebbles and cobblestones varies. Depth to the underlying bedrock ranges from 3 to 12 feet.

The Lamington soils range from strongly acid to slightly acid. They are strongly acid where their parent material is red shale and sandstone but are slightly acid where they were influenced by diabase and limestone.

The Lamington soils occur near the well drained Birdsboro soils and the moderately well drained Readington soils. In many places the Lamington soils are adjacent to the Bowmansville, Rowland, and Bermudian soils on the flood plains.

Lamington silt loam (0 to 3 percent slopes) (La).—This is the only Lamington soil mapped in Adams County. It has a moderately permeable subsoil and is nearly level and gently sloping. Erosion is not likely.

Drainage, the main problem of management, can be improved by bedding, open ditches, and diversion terraces at the foot of slopes. Because the subsoil is moderately fine textured, tile drains generally are not satisfactory, but random tile can be used to drain wet spots. If this soil is drained, it is suited to a cropping system of very low intensity. One such system consists of a row crop, a winter grain, and 3 or more years of hay or pasture. Suitable crops are corn, small grain, red clover, ladino, and timothy. (Capability unit IVw–1; woodland group 13; building site 12)

Lansdale Series

The Lansdale series consists of well-drained soils that are on moderate slopes in most places but are also on broad, gentle slopes, and on a few narrow, steep ridges. These soils are moderately deep or deep to soft sandstone and conglomerate that are yellow, brown, gray, and pink. Most areas of these soils occur in a band several miles wide that includes New Oxford and extends northeastward through the county.

A soil typical of the Lansdale series has a dark grayish-brown loam plow layer about 9 inches thick. This layer has fine granular structure, absorbs water readily, and is easy to work. The upper subsoil is dark-brown loam, and at a depth of 14 inches, it grades to brown gravelly loam that has subangular blocky structure and is slightly plastic when wet. Below a depth of 24 inches, the subsoil is very gravelly sandy loam that has fine granular structure and contains sandstone fragments and quartz pebbles that make up 65 to 85 percent of the soil mass. Below a depth of 32 inches, the substratum is brown to light yellowish-brown, weathered sandstone and conglomerate.

Loam is the only type of Lansdale soil mapped in the county, but some areas of silt loam and sandy loam occur. These soils are generally brown, gray, or yellow. These colors, to some extent, have been imparted by the underlying shale. The underlying shale ranges widely in color. The subsoil ranges from loam to sandy loam and, in some places, to silt loam. In areas where they merge with the Penn soils, Lansdale soils contain less sand and are redder than the soil described. Depth to weathered rock is 20 to 36 inches, and depth to hard sandstone or conglomerate ranges from 25 to 50 inches.

These soils are normally strongly acid, but in areas near the Conestoga soils they are influenced by limestone and may be medium acid or only slightly acid. In areas where they were derived from metamorphosed material, Lansdale soils are less acid and have darker colors throughout than has the profile described.

The Lansdale soils are near the shallow, sandy Steinsburg soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. In places the Lansdale soils occur near the redder Penn soils and the moderately well drained or somewhat poorly drained Lehigh soils.

Lansdale loam, 0 to 3 percent slopes, moderately eroded (LdA2).—This soil is more nearly level and slightly deeper to bedrock than the soil described for the series. Although it is permeable and easy to cultivate, it is susceptible to erosion and, in extremely dry periods, is susceptible to drought. A few areas mapped as this soil are uneroded or only slightly eroded.

This soil can be used as cropland if erosion is controlled and drought-resistant varieties of plants are used. It is suited to a cropping system of medium intensity consisting of a row crop, a small grain, and hay, each grown for 1 year. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, supplemented with cropland terraces, is generally needed in the more sloping areas. (Capability unit IIe–3; woodland group 5; building site group 5)

Lansdale loam, 3 to 8 percent slopes, moderately eroded (LdB2).—This is the soil described as typical of the series. It is highly susceptible to further erosion. A few areas have lost as much as three-fourths of the original surface soil. This moderately deep soil is moderate in available moisture capacity, and it tends to be droughty in dry periods. Included in mapped areas are a few areas that are only slightly eroded.

This soil can be used as cropland if erosion is controlled and drought-resistant varieties of plants are used. A cropping system of medium intensity that consists of a row crop, a small grain, and 1 year of hay can be followed. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, supplemented with diversion terraces and waterways, is generally needed to help control erosion. (Capability unit IIe–3; woodland group 5; building site group 5)

Lansdale loam, 3 to 8 percent slopes, severely eroded (LdB3).—This severely eroded soil has lost more than three-fourths of the original surface soil, mostly through sheet erosion. Shallow gullies have formed in many places. Much of the subsoil has been mixed into the plow layer and has lightened its color. This soil is moderately low in available moisture capacity and is droughty. Erosion has reduced the content of organic matter.

This soil can be used for crops, but careful management is needed to control erosion, to conserve moisture, and to increase the content of organic matter. The crop varieties

planted should be drought resistant. The most intensive cropping system that can be used is a row crop, a small grain, and 2 years of hay, or another system of low intensity. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, supplemented with diversion terraces and waterways, is needed to control erosion. Adding large amounts of manure and returning large amounts of crop residue to the soil help to conserve moisture and to maintain organic-matter content and soil structure. (Capability unit IIIe–3; woodland group 5; building site group 5)

Lansdale loam, 8 to 15 percent slopes, moderately eroded (LdC2).—This moderately eroded soil is steeper and slightly shallower than the soil described for the series. Many areas have lost as much as three-fourths of the original surface soil through sheet erosion. Shallow gullies have formed in some fields. This soil is only moderately deep, has moderate to moderately low available moisture capacity, and tends to be droughty. In many areas the organic-matter content is low. Included in mapping are a few slightly eroded areas.

Erosion is the main problem of management. Crops can be grown if the cropping system is of low intensity. A suitable cropping system is a row crop, a small grain, and 2 years of hay. Suitable crops are drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. Contour stripcropping, diversion terraces, and waterways are needed to control erosion. Adding manure and returning large amounts of crop residue to the soil help to conserve moisture and to maintain organic-matter content and soil structure. (Capability unit IIIe–3; woodland group 5; building site group 6)

Lansdale loam, 8 to 15 percent slopes, severely eroded (LdC3).—This steep, severely eroded soil has lost more than three-fourths of its original surface soil and has had subsoil mixed into the plow layer. Many shallow gullies have formed in some fields. This soil is only moderately deep and is droughty. The available moisture capacity and, in most areas, the organic-matter content are low.

This soil can be used for pasture or hay, but it needs careful management that controls erosion. In areas not in pasture, only a cropping system of very low intensity should be used. One such system is 1 year of a row crop, 1 year of a small grain, and 3 years of hay. Suitable crops are small grain, birdsfoot trefoil, and orchardgrass. Seeding should be in contour strips, and waterways may be needed to serve as outlets from diversion terraces. Pasture is damaged if it is grazed too heavily or too early in spring. (Capability unit IVe–2; woodland group 5; building site group 6)

Lawrence Series

The Lawrence series consists of somewhat poorly drained soils that developed in material weathered from limestone and calcareous material. Some of the parent material is residual, and some was washed in from slopes above. These soils are in depressions and drainageways and in other level or nearly level areas in the limestone areas between Littlestown and McSherrystown and in the Fairfield Valley.

A soil typical of the Lawrence series has a dark grayish-brown silt loam plow layer about 11 inches thick. This layer has weak, medium, subangular blocky structure, and it crumbles easily. It is easy to work and absorbs water readily. The subsoil is yellowish-brown silty clay loam that grades to yellowish-red silty clay at a depth of 16 inches. At a depth of 34 inches, the subsoil is yellowish-brown silty clay loam that has platy structure. The entire subsoil is mottled and is very sticky and plastic when wet. The substratum, at a depth of 62 inches, consists mostly of calcareous, weathered schist in various shades of brown, yellow, and gray. Calcareous schist or hard limestone occurs at about 70 inches.

The surface layer ranges from dark grayish brown to dark gray. The subsoil ranges from light brownish yellow to light gray and from silty clay loam to clay. Mottling begins at any depth between 10 and 15 inches. The depth to hard rock ranges from 4 to 15 feet.

The Lawrence soils are near the shallow Hollinger soils, the well drained Conestoga soils, the moderately well drained Wiltshire soils, and the poorly drained Guthrie soils. Near Fairfield the Lawrence soils are near the well-drained Athol soils.

Lawrence silt loam (0 to 5 percent slopes) (le).—This nearly level and gently sloping soil has been described as typical of the Lawrence series. It is slightly acid or neutral and has moderately high available moisture capacity. Runoff is slow, and the risk of erosion is slight. The internal movement of water is slow, and the soil dries out slowly in spring. Drainage is the main problem of management.

If this soil is properly drained, crops can be grown in a system consisting of a row crop, a small grain, and 2 years of hay, or in another system of low intensity. Suitable crops are corn, winter grain, birdsfoot trefoil, ladino clover, and timothy. Only water-tolerant varieties should be used. In the level or nearly level areas, bedding may be needed for disposing of excess water. This soil is compacted and its structure is destroyed if it is worked, or if grazing is permitted, when it is wet. Graded stripcropping, supplemented with diversion terraces and waterways, helps to dispose of excess water and, on slopes of 2 percent or more, to control erosion. Spots that remain wet can be drained by tile, but generally the clayey subsoil makes drainage by tile impractical. In many places open ditches are the most effective means of drainage. (Capability unit IIIw–1; woodland group 7; building site group 12)

Legore Series

The Legore series consists of moderately deep and deep, well-drained soils that developed in material weathered from diabase. These soils occur in the central part of this county in steep areas where narrow dikes of diabase have intruded up through the red shale. Some fairly large areas are undulating to moderately rolling.

A soil typical of the Legore series has a dark grayish-brown channery silt loam plow layer about 8 inches thick. This layer has granular structure and is friable when moist and slightly sticky and slightly plastic when wet. The upper subsoil is dark-brown, gritty silty clay loam that has strong blocky structure and is firm when moist and sticky and plastic when wet. At a depth of 13 inches, the subsoil is silt loam that has moderate structure and is slightly sticky and slightly plastic when wet. The substratum begins at a depth of about 22 inches and consists

mostly of yellowish-brown, gritty saprolite or weathered diabase. This material is brown and sugarlike, and in places it extends to a depth of 82 inches or more. Depth to hard bedrock is 2 to 15 feet.

The surface layer is generally channery silt loam, but in some areas it is silt loam or very stony silt loam. The subsoil ranges from silt loam to silty clay loam in most places, but in some places it is sandy loam. In some places depth to bedrock varies greatly within short distances. The lower part of the profile reflects the color of the underlying material and is yellow, red, or brown and has a grayish cast in some places. Some areas are stony and have rounded stones, large boulders, or both, on the surface. Stones and rock fragments occur throughout the profile.

These soils are medium acid to almost neutral. They are highly susceptible to erosion, and in some areas have lost more than three-fourths of their original surface soil. Permeability is rapid in the surface layer and moderate in the subsoil. Natural fertility and the available moisture capacity range from moderately high in the deeper, more nearly level areas to low in the steep, severely eroded areas. Because these soils are shallow to saprolite, they are droughty.

The Legore soils occur near the deep Montalto soils, the moderately well drained and somewhat poorly drained Mount Lucas soils, and the poorly drained Watchung soils. In places the Legore soils also are near the darker colored Brecknock and Lehigh soils.

The Legore soils are fairly extensive in Adams County. In some areas the stones interfere with cultivation. Growing cover crops, adding manure, and returning large amounts of crop residue to the soil help to control erosion, to maintain soil structure and organic-matter content, and to conserve moisture.

Legore channery silt loam, 3 to 8 percent slopes, moderately eroded (LgB2).—The profile of this soil is the one described for the series. Included in mapped areas are slightly eroded areas and some severely eroded areas. In some small areas, only a few fragments occur and the soil is not channery.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. A cropping system of low intensity that consists of a row crop, a small grain, and 2 years of hay should be followed. Excessive erosion can be controlled by contour stripcropping, diversion terraces, and waterways. Deep-rooted grasses and legumes are suitable pasture plants. Pastures should not be overgrazed. (Capability unit IIe–4; woodland group 8; building site group 7)

Legore channery silt loam, 8 to 15 percent slopes, moderately eroded (LgC2).—This moderately eroded soil is steeper than the soil described for the series, but the profiles of the soils are similar. Included in mapping are some slightly eroded areas and a few less channery areas.

Erosion, the main problem of management, can be controlled by contour stripcropping, diversion terraces, and grassed waterways. Crops should be grown only in a cropping system of low intensity. One such system consists of a row crop, a small grain, and 2 years of hay. This soil is suited to corn and small grain, but yields are low. It is also suited to deep-rooted, drought-resistant grasses and legumes. Pastures should be protected from overgrazing. (Capability unit IIIe–3; woodland group 8; building site group 8)

Legore channery silt loam, 8 to 15 percent slopes, severely eroded (LgC3).—This soil is steeper and more severely eroded than the soil described for the series. A considerable amount of the silty clay loam subsoil has been mixed into the plow layer. Erosion has reduced the available moisture capacity, and the soil is droughty. It puddles easily, especially if it is cultivated when wet, and it is very hard when it dries. Included in mapped areas are a few severely eroded areas of Montalto silt loam.

This soil is best suited to hay and pasture. Crops should be grown only in a cropping system of very low intensity. In one such system a small grain is followed by 3 or more years of hay. Suitable crops are small grain, birdsfoot trefoil, red clover, and orchardgrass. Seeding should be in contour strips. In some places diversion terraces and grassed waterways are needed. (Capability unit IVe–3; woodland group 14; building site group 8)

Legore channery silt loam, 15 to 25 percent slopes, severely eroded (LgD3).—This severely eroded, steep soil is shallower than the soil described for the series. Little or none of the original surface soil remains, and the silty clay loam subsoil is exposed in many places, especially where there are shallow gullies. Erosion has reduced the available moisture capacity, and the soil is droughty. Included in mapped areas are a few areas of severely eroded, deeper Montalto soils.

This soil is well suited as woodland, but it can be used for pasture. White pine is suitable for planting. Suitable pasture plants are birdsfoot trefoil, orchardgrass, and bluegrass. Seeding should be in contour strips, and diversion terraces should be used where needed. (Capability unit VIe–1; woodland group 14; building site group 8)

Legore channery silt loam, 25 to 35 percent slopes, severely eroded (LgE3).—The profile of this severely eroded, steep soil is thinner than that of the soil described for the series. Most of the original surface soil has been removed by erosion. The present surface layer consists mostly of finer textured subsoil material that, in places, has been mixed with gritty material from the soft, weathered underlying rock. This soil is droughty because erosion has reduced the available moisture capacity. Included in mapping are areas having slopes of more than 35 percent and a few areas that are not severely eroded. Also included are some small areas of deeper, severely eroded Montalto soils.

Because this soil is steep, erodible, and droughty, it is not suited to cultivated crops, and it has very limited use for pasture. It can be used as woodland, as wildlife habitat, and for recreation. White pine is suitable for reforesting. (Capability unit VIIe–1; woodland group 18; building site group 9)

Lehigh Series

The Lehigh series consists of moderately well drained and somewhat poorly drained, shallow and moderately deep soils. These soils developed from shaly material that the heat from lava flows baked to a hard, bluish or purplish slate. These soils occur on gentle to moderate slopes that extend downward from the diabase ridges throughout the central part of the county. They are also

in narrow bands throughout the red shale and sandstone areas of the county.

A typical moderately eroded Lehigh soil has a dark-gray silt loam plow layer about 8 inches thick. This layer is very friable when moist and has weak, fine, granular structure. The upper subsoil is dark-gray silty clay loam that is faintly mottled with gray and olive brown. It is firm when moist and sticky and plastic when wet. The amount of shale fragments increases with depth, and at 30 inches these fragments make up 65 percent of the soil mass. The lower subsoil is dark-gray very shaly silt loam. At a depth of 40 inches, the substratum is black, partly weathered porcelanite.

The surface layer generally is silt loam, but it ranges to loam or shaly silt loam. Some areas are channery or very stony, and in places a few boulders are on the surface. In some areas the surface layer is dark grayish brown. In thickness it ranges from 16 inches in level, wooded, or very stony areas to about 8 inches or less in cultivated or severely eroded areas. The subsoil ranges from mottled dark gray to yellowish brown and from fine silt loam to silty clay loam or gritty silty clay. Depth to mottling is ordinarily 14 to 18 inches but ranges from 8 inches to 30 inches.

The subsoil is moderately slow in permeability, and early in spring these soils have a high water table that delays planting and reduces crop yields in wet years.

The Lehigh soils occur near the Penn, Readington, and Croton soils of the red shale areas and near the Montalto, Mount Lucas, and Watchung soils of the diabase ridges. The Lehigh soils are also near the well-drained Brecknock soils.

Except for the fairly small stony areas, most of the acreage of Lehigh soils has been cleared for cultivation.

Lehigh silt loam, 0 to 3 percent slopes (LhA).—This soil is more nearly level and slightly deeper than the soil described for the series. It has been damaged very little, if at all, by erosion. The surface layer is about 9 inches thick. Runoff is very slow, and water moves through the subsoil at a slow rate. Included in mapped areas are some eroded areas.

Unless this soil is drained, it is suited only to moisture-tolerant plants. Drained areas can be planted to corn or small grain in a cropping system that provides close-growing crops most of the time. A crop of corn can be followed by a winter small grain and 2 or more years of hay. Suitable crops are corn, winter small grain, birdsfoot trefoil, ladino clover, and timothy. Large additions of lime and fertilizer are generally needed, and liberal use of barnyard manure is especially desirable. Drainage can be improved by graded rows, graded strips, drainage terraces, and open ditches. Random tile can be used in springy spots.

This soil remains wet until late in spring, and plowing should be delayed until it is dry. When the soil is wet, plowing destroys soil structure and the feet of cattle also cause damage. In the wetter areas the fine-textured subsoil hardens when it dries. (Capability unit IIIw–1; woodland group 12; building site group 10)

Lehigh silt loam, 3 to 8 percent slopes, moderately eroded (LhB2).—This is the soil described as typical of the series. In many places sheet erosion has removed as much as three-fourths of the original surface soil. Further erosion is likely because the tight subsoil impedes internal drainage and increases runoff. Some areas mapped as this soil are only slightly eroded.

Wetness is the main limitation on this soil, but erosion is also a hazard. If this soil is drained and erosion is controlled, hay or pasture are suitable, or a cropping system of low intensity can be used. One such system consists of a row crop, a winter small grain, and 2 years of hay. Suitable crops are corn, winter small grain, birdsfoot trefoil, ladino clover, and timothy. Drainage can be improved by bedding, graded strips, diversion terraces, and waterways. Spots that remain wet should be drained by tile. Adding manure and returning crop residue to the soil help to maintain soil structure and organic-matter content. Plowing and grazing should not be permitted when the soil is wet. (Capability unit IIIw–1; woodland group 12; building site group 10)

Figure 11.—**Profile of Lehigh silt loam, thin solum variant. The light-colored subsoil is underlain by dark-gray shaly rock. Marks on stick are 6 inches apart.**

Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded (LtB3).—This severely eroded soil is shallower than the soil described for the series. The depth to weathered shale or porcelanite is 16 inches (fig. 11). Sheet erosion has been moderate to severe, and shallow gullies have formed. Material from the yellowish-brown silty clay loam subsoil has been mixed into the plow layer, which is about 8 inches thick. The subsoil contains many fragments of shale. Rainfall runs off quickly instead of percolating downward, mainly because the subsoil is compact and slowly permeable. This soil is alternately very wet and very dry. It is highly susceptible to further erosion and should not be worked when wet. Included in mapped areas are some deeper, less sloping, less eroded areas.

This soil is poorly suited to row crops and generally is better suited to hay or pasture. If erosion is controlled,

crops can be grown in a cropping system of low intensity. Suitable crops are corn, wheat, and oats. Corn yields generally are low. Birdsfoot trefoil and bluegrass are the most suitable hay and pasture plants. Best for hay are the upright varieties of birdsfoot trefoil, and best for pasture are the low-growing varieties. Reseeding should be done in graded strips, and diversion terraces and seeded waterways should be used. (Capability unit IVe–4; woodland group 16; building site group 12)

Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded (LtC3).—This severely eroded soil is steeper and shallower than the soil described for the series. It has a slowly permeable subsoil, has rapid runoff, and is highly susceptible to further erosion. Other limitations are droughtiness in summer and wetness in wet periods. Seepage is considerable on some of the steeper slopes. Included in mapping are some shallow areas on slopes of more than 15 percent.

This soil is suited to pasture if careful management is followed. Drought-resistant varieties of birdsfoot trefoil and orchardgrass are suitable plants if they are seeded in contour strips. This soil should not be worked or grazed unless it is dry, and overgrazing should be avoided at all times. (Capability unit VIe–4; woodland group 16; building site group 12)

Lehigh very stony silt loam, 0 to 10 percent slopes (LvB).—This very stony soil is slightly deeper than the soil described for the series. It is no more than slightly eroded and has a surface layer 9 to 16 inches thick. Included in mapping are some eroded areas and some areas that have slopes of more than 10 percent.

The acreage is small, and most of it is wooded, for the stones limit the suitability of this soil for other uses. Birdsfoot trefoil, bluegrass, or other pasture plants could be grown if the stones and trees are removed, but this operation is very expensive. (Capability unit VIs–2; woodland group 12; building site group 10)

Lindside Series

The Lindside series consists of moderately well drained and somewhat poorly drained soils that formed on flood plains in sediments washed from areas of Conestoga or Athol soils. These sediments weathered from limestone or other calcareous material. The Lindside soils are on first bottoms in Fairfield Valley and in areas of limestone northeast of Littlestown and around McSherrystown, Edgegrove, and Brushtown.

A soil typical of the Lindside series has a dark grayish-brown silt loam plow layer that is about 8 inches thick and is friable and easy to work. This layer is nearly neutral, contains a few pebbles, and is slightly sticky and slightly plastic when wet. The plow layer is underlain by dark-brown silty clay loam that has subangular blocky structure. At a depth of about 12 inches, the subsoil is dark yellowish-brown silty clay loam that has subangular blocky structure and is slightly sticky and slightly plastic when wet. Brownish-gray clay loam mottled with yellowish brown and gray occurs at a depth of 18 inches. This layer has blocky structure and is sticky and plastic when wet. Mottling and gravel increase in amount with depth. Gravel or limestone is at a depth of 40 inches or more.

The color of these soils ranges from dark grayish brown to olive or to yellowish brown mottled with brown, yellow, red, or purplish gray. Varying amounts of gravel occur on the surface and throughout the profile. The subsoil ranges from silt loam to clay and contains lenses of sand or gravel.

The Lindside soils occur near the poorly drained Melvin soils and the very poorly drained Dunning soils, which are on flood plains. In some places they are near the Lawrence, Wiltshire, Conestoga, and Athol soils, which are above flood plains.

In Adams County areas of Lindside soils are mapped only in an undifferentiated unit with areas of Melvin soils.

Manor Series

Soils of the Manor series have a thin solum and are well drained. They occur mainly on the steeper slopes in the extreme southeastern part of the county, but some areas are gently sloping.

A soil typical of the Manor series has a grayish-brown loam plow layer about 7 inches thick. This layer has weak, fine, granular structure, absorbs water readily, and is easy to work. It has many pores. Schist fragments make up about 10 percent of the plow layer. The subsoil is light yellowish-brown channery loam grading to olive-yellow channery loam or very channery loam. This layer has subangular blocky structure and is friable when moist and slightly sticky and slightly plastic when wet. At a depth of 18 inches, the substratum is olive-yellow and light-gray, weathered schist or saprolite.

The surface layer ranges from loam to very channery loam. The subsoil is most commonly loam or silt loam, but in a few places it is silty clay loam. It is generally channery or very channery. In many areas the content of mica is high enough to make these soils feel greasy. Ordinarily, their structure is weakly or moderately developed. Not much clay occurs, even in the lower horizons. The substratum consists mostly of fragmented material that permits fairly deep penetration of roots. This fragmented material extends to a depth of 10 feet in some areas. Depth to hard bedrock ranges from 3 to 20 feet.

These soils are medium acid or strongly acid. They can hold a small to moderate amount of moisture and plant nutrients. Water moves through these porous soils at a fairly rapid rate and generally leaches them strongly. Erosion is a hazard in places.

The Manor soils occur near the moderately deep Glenelg soils, the moderately well drained Glenville soils, and the poorly drained Worsham soils.

Manor loam, 3 to 8 percent slopes, moderately eroded (MaB2).—This is the soil described as typical of the series. In some areas it has lost as much as three-fourths of its original surface soil, and it is highly susceptible to further erosion. Included in mapping are some very channery areas, a few slightly eroded areas, some severely eroded areas, and some nearly level areas.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. A suitable cropping system consists of 1 year of a row crop, 1 year of a small grain, and 1 year of hay, or another system of medium intensity. Contour stripcropping, supplemented with diversion terraces and waterways, is needed to control erosion in some places. Adding barnyard manure and returning large amounts of crop residue to the soil help to conserve moisture and to maintain organic-matter content.

Pasture should be seeded to deep-rooted grasses and legumes. Satisfactory yields of apples and peaches may be obtained if the orchards are carefully managed. (Capability unit IIe–3; woodland group 8; building site group 5)

Manor loam, 8 to 15 percent slopes, moderately eroded (MaC2).—This soil is steeper than the soil described for the series, but the profiles of the two soils are similar. Included in mapped areas are some very channery areas and a few slightly eroded areas.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. A suitable cropping system is 1 year of corn, 1 year of a small grain, and 2 years of hay, or another system of low intensity. Contour stripcropping, supplemented with diversion terraces and waterways, is needed to control erosion. Adding manure and returning large amounts of crop residue to this soil help to conserve moisture and to maintain organic-matter content. This soil can be used for orchards or for pasture on which grazing is controlled. If management is at a high level, satisfactory yields of apples and peaches are produced. (Capability unit IIIe–3; woodland group 8; building site group 6)

Manor loam, 8 to 15 percent slopes, severely eroded (MaC3).—This severely eroded, strongly sloping soil is shallower, more droughty, and generally more channery than the soil described for the series. Most areas are very channery.

This soil is best suited to pasture, but crops can be grown if a cropping system of very low intensity is used. One such system is a row crop, a small grain, and 3 or more years of hay or pasture. Suitable crops are corn, small grain, birdsfoot trefoil, and orchardgrass. Yields of corn are low. Seeding should be done in contour strips, and waterways may be needed. Conserving moisture, increasing organic-matter content, and controlling erosion are the major requirements of management. Pasture is damaged if it is grazed too heavily or too early in spring. (Capability unit IVe-2; woodland group 14; building site group 6)

Manor loam, 15 to 25 percent slopes, severely eroded (MaD3).—This steep, severely eroded soil is shallower than the soil described as typical of the series. Erosion has removed most of the original surface soil, and in many areas gullies have been cut into the underlying material. This soil is low in available moisture capacity and is droughty. Included in mapped areas are some areas of Manor soils that are only moderately eroded and areas that have slopes of more than 25 percent. Also included are some areas of Glenelg soils having slopes of 15 percent or more.

This soil is suited to trees or other permanent cover, and it can be used for pasture if management is at a high level. Suitable plants are drought-resistant varieties of birdsfoot trefoil, orchardgrass, and other plants. Reseeding should be in contour strips to help control erosion and conserve moisture until the pasture is established. Smoothing, mulching, and heavy seeding may be needed to stabilize gullies. (Capability unit VIe–2; woodland group 14; building site group 6)

Melvin Series

This series consists of poorly drained and somewhat poorly drained soils on flood plains in recent alluvium that washed from areas of Conestoga or Athol soils and consists of weathered limestone or other calcareous material. These soils are on first bottoms of streams in the Fairfield Valley and in areas of limestone northeast of Edgegrove and Brushtown.

A soil typical of the Melvin series has a dark grayish-brown silt loam plow layer that is about 8 inches thick and is mottled faintly with olive brown and dark grayish brown. This layer has fine granular structure, is friable when moist and slightly sticky and slightly plastic when wet, and is fairly easy to work. The subsoil is dark grayish-brown silty clay loam distinctly mottled with brown and very dark grayish brown. This layer is firm when moist and is slightly sticky and plastic when wet. It is generally slightly acid. The subsoil extends to a depth of 40 inches or more and is underlain by gravel or limestone.

These soils are dark grayish brown to olive or dark gray and are mottled with brown, yellow, red, or purplish gray. Varying amounts of sand and gravel occur on the surface and throughout the profile. The subsoil ranges from silt loam to clay and contains lenses of sand or gravel.

The Melvin soils occur near the moderately well drained Lindside soils and the very poorly drained Dunning soils, which are on the flood plains. In places they are near the Guthrie, Lawrence, Wiltshire, Conestoga, and Athol soils, which are above the flood plains.

In Adams County areas of Melvin soils are mapped only in an undifferentiated unit with areas of Lindside soils.

Melvin and Lindside silt loams (0 to 3 percent slopes) (Me).—These soils are poorly drained to moderately well drained. They are subject to scouring by floods. The subsoil has slow or moderately slow permeability, and the water table is seasonally high. Available moisture capacity is moderate to high. These soils are slightly acid or neutral.

Drainage is the main management problem. Generally needed in the wetter areas are bedding, surface ditches, and random tile. Except in the better drained areas, only a cropping system of low intensity should be used. In one such system, a row crop is followed by a crop of small grain, and then hay is grown for 2 years. In the better drained areas, a cropping system of medium intensity can be used. Suitable crops are winter grain, red clover, ladino clover, and timothy. Corn can be grown in the better drained areas. Returning crop residue to the soil and adding manure help to reduce scouring and to maintain soil structure and organic-matter content. (Melvin soil: capability unit IIIw–3. Lindside soil: capability unit IIw–2. Both soils in woodland group 3 and building site group 13)

Montalto Series

The Montalto series consists of moderately deep and deep, well-drained soils that developed from weathered diabase. This rock, locally called ironstone or Gettysburg granite, has intruded upward between beds of sandstone and shale. Montalto soils occur mostly in the central part of the county on narrow ridges or dikes of the red shale areas that extend from the Maryland State line northward to York County.

A soil typical of the Montalto series has a brown silt loam plow layer about 9 inches thick. The plow layer has weak, fine, granular structure and is friable when

moist and slightly sticky and slightly plastic when wet. It grades to reddish-brown silty clay loam that has moderate, blocky structure. At a depth of 12 to 21 inches, the subsoil is clay loam that has stronger blocky structure than the layer above and is firm when moist and sticky and plastic when wet. The lower part of the subsoil is slightly coarser textured than the upper part. It is silty clay loam that has strong blocky structure and is firm when moist and sticky and plastic when wet. Black coats are common on the peds in the lower subsoil, and there are gray and yellow specks. At a depth of 36 inches, the substratum is strong-brown silt loam speckled with dark brown and reddish yellow. It is massive and is only slightly sticky and slightly plastic when wet. In most places the depth to diabase is 3 to 8 feet.

The surface layer is channery in some places, and in many places it is stony and contains a few to many large diabase boulders. Some of the boulders stand nearly 30 feet high in the Devils Den area of the Gettysburg National Military Park. The surface layer is dark brown to reddish brown, and the subsoil is red or yellow. The subsoil is silty clay loam or clay loam, and in the lower part, it is normally gritty and, in some places, sandy.

Montalto soils are generally slightly acid or moderately acid. Their surface layer is rapidly permeable and absorbs water readily, but their subsoil has moderately slow permeability. Except in severely eroded areas, the available moisture capacity is high.

The Montalto soils occur with the shallow Legore soils, with the moderately well drained to somewhat poorly drained Mount Lucas soils, and with the poorly drained Watchung soils. In places they are near the darker colored Brecknock and Lehigh soils.

The Montalto soils are fairly extensive in Adams County (fig. 12). Except in areas that are steep, stony, or both, they produce satisfactory yields of crops and pasture.

Montalto silt loam, 0 to 3 percent slopes (MoA).—This soil is more nearly level and not so eroded as the soil described for the series, and it has a slightly thicker surface layer. Included in areas mapped as this soil are small eroded areas.

This soil is suited to corn, potatoes, and other row crops, which can be grown continuously. Erosion is not generally a hazard in most places, but contour farming is helpful on slopes of more than 2 percent. This soil is also suited to bush fruits, small grain, and alfalfa. Crop yields are satisfactory if management is good. Although some level areas do not have good air drainage, yields of fruit are favorable if management is efficient. In areas used for bush fruits, a mulch or a winter cover crop is needed for conserving moisture and maintaining organic-matter content and soil structure. (Capability unit I–1; woodland group 5; building site group 3)

Montalto silt loam, 3 to 8 percent slopes, moderately eroded (MoB2).—This soil is less sloping than the soil described for the series. It has high available moisture capacity. Included in areas mapped as this soil are small areas that are only slightly eroded and small areas that are severely eroded.

This soil is suited to a cropping system consisting of 2 years of row crops, 1 year of a small grain, and 1 year of hay, or to another system of high intensity. Suitable crops are corn, potatoes, small grain, alfalfa, and orchardgrass. Crop yields are satisfactory if management is good. If orchards are managed at an extremely high level, favorable yields of fruit can be obtained. To control erosion in cultivated areas, terraces or contour stripcropping may be needed, along with diversion terraces and waterways. Also beneficial are cover crops.

Figure 12.—**In the background is a wooded area on Montalto soils on Round Top, which is near Gettysburg. In the foreground are soils of association 4.**

The severely eroded included areas need very careful management to conserve moisture, to control erosion, and to maintain organic-matter content and good soil structure. Because much of the fine-textured subsoil is mixed with the plow layer, the severely eroded areas puddle if they are tilled when wet, and they are very hard when they dry. (Capability unit IIe–1; woodland group 5; building site group 3)

Montalto silt loam, 8 to 15 percent slopes, moderately eroded (MoC2).—This is the soil described as typical of the series. Included in mapped areas are a few small areas that are only slightly eroded and a few small areas that are severely eroded.

This soil is suited to a cropping system consisting of a row crop, a small grain, and hay, each grown for 1 year. Suitable crops are corn, small grain, alfalfa, orchardgrass, and bush and tree fruits. Management for cultivated crops should provide cover crops, stripcropping, diversion terraces, and waterways. If management of orchards is extremely good, satisfactory yields of fruit can be obtained.

The severely eroded included areas need very careful management to conserve moisture, to control erosion, and to maintain organic-matter content and good soil structure. Because much of the fine-textured subsoil is mixed into the plow layer, the severely eroded areas puddle if they are worked when wet, and they harden when they dry. (Capability unit IIIe–1; woodland group 5; building site group 4)

Montalto very stony silt loam, 0 to 8 percent slopes (MsB).—This very stony soil is more gently sloping and is slightly less eroded than the soil described for the series. Stones and boulders ranging from 10 inches to 10 feet or more in diameter cover 15 to 90 percent of the surface and occur throughout the profile. Included in areas mapped as

this soil are a few small eroded areas and a few areas of a shallow Legore soil.

Most of this soil is woodland or is in pasture. If enough of the stones can be removed to permit seedbed preparation and good pasture management, satisfactory yields of birdsfoot trefoil, orchardgrass, and bluegrass can be obtained. The steeper slopes should be reseeded in contour strips to help control erosion and conserve moisture while the pasture is being established. If management of orchards is extremely good, satisfactory yields of fruit can be obtained. In woodland, trees should be selectively cut and those not wanted should be culled. Also, trees should be protected from fire and grazing. (Capability unit VIs–1; woodland group 5; building site group 3)

Montalto very stony silt loam, 8 to 25 percent slopes (MsD).—This very stony soil is less eroded and, in places, is steeper than the soil described for the series. Stones and boulders ranging from 10 inches to 10 feet or more in diameter occupy 15 to 90 percent of the surface and also occur throughout the profile. Included in areas mapped as this soil are a few areas of an eroded soil and a few areas of a shallow Legore soil.

Most of this soil is woodland, but some of the more gentle slopes are in pasture, and a few areas are idle. This soil is suited as woodland, for wildlife habitat, and for recreational areas. In cleared areas, satisfactory yields of orchardgrass, birdsfoot trefoil, and bluegrass are obtained. In woodland, trees should be selectively cut and protected from fire and grazing. To improve areas for wildlife, small idle spaces can be planted to autumn olive, black haw, filbert, or other shrubs. (Capability unit VIs–1; woodland group 5; building site group 4)

Montalto very stony silt loam, 25 to 50 percent slopes (MsE).—This very stony soil is steeper and less eroded than the soil described for the series. Stones and boulders ranging from 10 inches to 10 feet in diameter occupy 15 to 90 percent of the surface and also occur throughout the profile. Included in areas mapped as this soil are a few areas of eroded soil and of a shallow Legore soil.

Most of this soil is wooded, but a few areas are idle. Woodland, wildlife habitat, and recreational areas are suitable uses. In woodland, trees should be selectively cut and protected from fire and grazing. To benefit wildlife, small idle areas can be planted to autumn olive, black haw, filbert, or other shrubs. (Capability unit VIIs–1; woodland group 6; building site group 9)

Mount Lucas Series

The Mount Lucas series consists of moderately deep and deep, moderately well drained soils that formed in material weathered from diabase. These soils occur in the central part of the county in nearly level and gently sloping areas where the diabase has protruded through sandstone and shale.

A soil typical of the Mount Lucas series has a brown silt loam plow layer about 8 inches thick. This layer has weak, fine, granular structure and absorbs water readily. Underlying the plow layer is a thin layer of dark yellowish-brown silt loam underlain by dark-brown silty clay loam and brown silty clay loam that is firm when moist and contains a few fine black specks. At a depth of 18 inches, the subsoil is mottled with strong brown and grayish brown. The movement of water is moderately slow, and the penetration of roots is somewhat impeded. At a depth of 28 to 39 inches, the substratum occurs. It consists of brown, gritty silty clay loam mottled with grayish brown, and is underlain by soft, gritty saprolite.

In places stones and large diabase boulders are on the surface. In most places the subsoil ranges from heavy silt loam to gritty silty clay loam, but in some places it is sandy loam. Depth to mottling ranges from 15 to 30 inches but generally is between 16 and 20 inches. The surface layer and subsoil combined range from 2½ to 4 feet in thickness.

These soils are slightly acid or medium acid. In areas that are not severely eroded, they are productive and fairly easy to work. The available moisture capacity is high. Permeability is rapid in the surface layer and moderate in the subsoil.

The Mount Lucas soils occur near the Legore soils, the moderately deep and deep, well-drained Montalto soils, the somewhat poorly drained Mount Lucas soils, and the poorly drained Watchung soils. In places they are near the darker colored Brecknock and Lehigh soils.

Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded (MtA2).—This soil is more nearly level than the soil described for the series. Included in mapping are some stony areas and some severely eroded areas.

A suitable cropping system is 1 year of a row crop, 1 year of a small grain, and 1 year of hay, or another system of medium intensity. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Moisture-tolerant varieties of alfalfa should be seeded. Graded strips, diversion terraces, and waterways may be needed to manage water and to control erosion. Areas that remain wet can be drained with random tile. Tilling or grazing should not be permitted when this soil is wet. (Capability unit IIe–5; woodland group 7; building site group 10)

Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded (MtB2).—This is the soil described as typical of the series. The moderate erosion has been caused by runoff from higher, more strongly sloping soils. Seepage spots may appear in winter and early in spring. Included in mapped areas are some stony areas and a few severely eroded areas.

This soil is suited to corn, small grain, orchardgrass, and moisture-tolerant varieties of alfalfa. A cropping system that consists of 1 year of a row crop, 1 year of a small grain, and 1 year of hay, or some other system of medium intensity can be followed. Cover crops, graded stripcropping, diversion terraces, and waterways are good conservation practices. Random tile and surface ditches may be needed in some areas. Tilling or grazing should not be permitted when this soil is wet. (Capability unit IIe–5; woodland group 7; building site group 10)

Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded (MtC2).—This moderately eroded soil is steeper than the soil described for the series, but the profiles of the two soils are similar. Included in mapping are a few stony areas and some severely eroded areas.

Suitable crops are corn, small grain, red clover, ladino clover, and timothy. These crops can be grown in a cropping system consisting of a row crop, a winter grain, and 2 years of hay or pasture, or in another system of low intensity. Good management includes practices to control water and further erosion. Graded stripcropping, diversion terraces, and waterways are needed. (Capability unit IIIe–5; woodland group 7; building site group 11)

Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes (MuA).—This soil is more nearly level than the soil described for the series. Erosion is not likely, but the mottles near the surface indicate that drainage in the subsoil is impeded. Included in mapped areas are some stony areas.

Corn, birdsfoot trefoil, ladino clover, and timothy can be grown in a cropping system of low intensity. One such system is a row crop, a small grain, and 2 years of hay. Bedding can be used to dispose of excess surface water. Graded strips, cropland diversions or diversion terraces, and waterways are helpful in disposing of excess water on slopes of more than 2 percent. Spots that remain wet should be drained with tile. Grazing or tilling should not be permitted when this soil is wet. (Capability unit IIIw–1; woodland group 12; building site group 12)

Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes (MuB).—This soil is wetter and more highly mottled than the soil described as typical of the series. Slopes of 5 to 8 percent are dominant. In some places water seeps from high, more sloping soils in winter and early in spring. Although this soil is not more than slightly eroded, it is susceptible to erosion if it is left bare. Included in areas mapped as this soil are some stony areas.

Corn, birdsfoot trefoil, ladino clover, or timothy can be grown in a cropping system that consists of 1 year of a row crop, 1 year of a small grain, and 2 years of hay, or in another system of low intensity. Because drainage in the subsoil is impeded, low yields of some crops can be expected. Graded strips, supplemented with diversion terraces and waterways, may be needed for managing water and controlling erosion. Spots that remain wet should be drained with tile, and bedding is helpful in some areas. Grazing or tilling should not be permitted when the soil is wet. (Capability unit IIIw–1; woodland group 12; building site group 12)

Myersville Series

The Myersville series consists of deep and moderately deep, well-drained soils that developed from weathered basic rocks, mostly greenstone. These soils occur in the western part of the county in the moderately steep to gently sloping areas of South Mountain.

A soil typical of the Myersville series has a brown silt loam plow layer about 9 inches thick. This layer has fairly mellow, fine, granular structure; it absorbs water readily and is easily tilled. The subsoil is yellowish-red silty clay loam that is channery at a depth of about 14 inches. This layer permits deep penetration of water and roots and contains enough clay to hold large amounts of plant nutrients. At a depth of about 38 inches, the substratum is yellowish-brown channery loam that contains reddish-brown saprolite and many channery fragments of greenstone.

The surface layer is normally silt loam, but in some places it is channery or stony. The surface layer is brown, grayish brown, or reddish brown. The subsoil is silty clay loam or clay loam. Depth to bedrock is 2½ to 5 feet.

The Myersville soils occur near the lighter colored Highfield soils, the shallow Catoctin soils, the moderately well drained Buchanan soils, and the poorly drained Rohrersville soils.

Myersville soils are well suited to native trees, and many areas are wooded. Cleared areas are used for orchards, crops, or hay and pasture. Except in some severely eroded areas, these soils produce satisfactory yields.

Myersville silt loam, 0 to 3 percent slopes, moderately eroded (MvA2).—This moderately eroded soil is more nearly level and slightly deeper than the soil described for the series. Slopes of more than 1 percent are dominant. This soil is permeable and has high available moisture capacity. Tilth is generally good. Included in mapped areas are a few slightly eroded areas and some severely eroded areas.

Most of the acreage has been cleared and is used for crops. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity. Suitable crops are corn, potatoes, bush and tree fruits, small grain, alfalfa, and orchardgrass. Yields are satisfactory. Contour strips, supplemented with diversion terraces or cropland terraces, are needed to control erosion on slopes of 2 percent or more.

To conserve moisture and soil, orchards should be kept in permanent sod, or cover crops should be planted and trashy cultivation used. Areas in bush fruits can be mulched or seeded to a winter cover crop to help control erosion, to maintain soil structure, and to conserve moisture. (Capability unit IIe–2; woodland group 5; building site group 1)

Myersville silt loam, 3 to 8 percent slopes, moderately eroded (MvB2).—This moderately eroded, gently sloping soil is slightly deeper than the soil described for the series. It is permeable and is high in available moisture capacity. Tilth is generally good. Mapped with this soil are a few slightly eroded areas and some severely eroded areas.

If carefully managed, this soil produces satisfactory yields of corn, potatoes, bush and tree fruits, small grain, alfalfa, and orchardgrass. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity. Contour stripcropping and cropland terraces or diversion terraces are needed to control erosion.

For reducing runoff and maintaining soil structure, orchards can be kept in permanent sod, or cover crops can be planted and trashy cultivation used. Areas in bush fruits can be protected by a mulch or by a winter cover crop. (Capability unit IIe–2; woodland group 5; building site group 1)

Myersville silt loam, 8 to 15 percent slopes, moderately eroded (MvC2).—This is the soil described for the series. It is the most extensive Myersville soil in Adams County. It is permeable and is high in available moisture capacity. Tilth is generally good.

Most of this soil is used for orchards and cultivated crops, but some areas are used for pasture or hay, and some are wooded. Crops can be grown in a cropping system that consists of a row crop, a small grain, and 1 year of hay, or in another system of medium intensity. If erosion is controlled and moisture is conserved, this soil produces satisfactory yields of corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. Cover crops, contour strips, diversion terraces, and waterways are generally needed to control erosion.

This is one of the best soils for orchards in Adams County. To conserve soil and to reduce runoff orchards should be kept in permanent sod, or cover crops should be planted and trashy cultivation used. Areas in bush fruits should be mulched or seeded to winter cover crops to help control erosion, maintain soil structure, and reduce runoff. (Capability unit IIIe–2; woodland group 5; building site group 2)

Myersville silt loam, 8 to 15 percent slopes, severely eroded (MvC3).—This severely eroded soil is shallower than the soil described for the series. Its surface layer is less than 9 inches thick. In many places yellowish-red silty clay loam from the subsoil has been mixed into the plow layer. Erosion has reduced the available moisture capacity. This soil is less permeable and generally has poorer tilth than the moderately eroded Myersville soils. It puddles if it is worked when wet, and it hardens when it dries.

This soil is suited to a cropping system consisting of a row crop, a small grain, and 3 or more years of hay or pasture, or to another system of very low intensity. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass. Careful management that provides for adding large amounts of manure and returning crop residue to the soil is needed to control erosion, conserve moisture, and maintain organic matter and soil structure.

Orchards should be kept in permanent sod, and areas in bush fruits should be protected by a mulch or by a winter cover crop. (Capability unit IVe–1; woodland group 5; building site group 2)

Myersville silt loam, 15 to 25 percent slopes (MvD).—This steep soil is less eroded than the soil described for the series. A cover of trees has protected most areas from erosion. This soil is permeable and is high in available moisture capacity. Tilth is generally good. Included in mapped areas are some moderately eroded areas.

If crops are grown, careful management that provides cover crops, contour stripcropping, diversion terraces, and waterways is needed to control erosion.

A suitable cropping system is a row crop, a small grain, and 3 or more years of hay, or another system of very low intensity. Suitable crops are corn, small grain, bush and tree fruits, alfalfa, and orchardgrass.

Orchards should be kept in permanent sod, and areas in bush fruits should be mulched or planted to winter cover crops. (Capability unit IVe–1; woodland group 5; building site group 2)

Myersville silt loam, 15 to 25 percent slopes, severely eroded (MvD3).—This severely eroded soil is steeper and shallower than the soil described for the series. Depth to bedrock is about 28 inches. Loss of surface soil, and its organic matter, has lowered the capacity of the soil to hold water and nutrients for plant use. The soil tends to be droughty. Included in mapped areas are areas having slopes of more than 25 percent.

This soil can be used for pasture or for orchards. Under careful management, satisfactory yields of apples, peaches, and cherries are obtained. A permanent sod is needed in orchards. Birdsfoot trefoil, orchardgrass, and bluegrass are the best pasture plants. Diversion terraces and waterways help in controlling erosion and managing water. (Capability unit VIe–3; woodland group 5; building site group 2)

Penn Series

The Penn series consists of moderately deep and shallow, well-drained soils that developed on weak-red or purplish-red sandstone and shale. Gently sloping to moderately sloping areas of these soils, locally called red lands, extend from the Maryland State line northeastward through the middle of Adams County.

A soil typical of the Penn series has a reddish-brown silt loam plow layer about 8 inches thick. This layer contains a few fragments of red shale, but the layer is loose, friable, and easy to work. The subsoil is reddish-brown to weak-red silt loam or silty clay loam that is slightly sticky when wet and has weak subangular blocky structure. Although fragments of shale are common in the subsoil, air and water move freely and roots penetrate easily. The subsoil extends to a depth of about 27 inches and is underlain by a strong, platy substratum in which fragments of shale and siltstone make up 95 percent of the volume. The substratum restricts the penetration of roots. Hard shale is at a depth of 34 inches.

The surface layer ranges from dark reddish brown to dark reddish gray. In severely eroded areas, it is silty clay loam and is slightly sticky when wet. Where the Penn soils merge with the shallow Klinesville soils, the depth to hard shale is generally about 20 inches and the Penn soils have a higher than normal content of shale fragments. Depth to hard shale is 2 or 3 feet.

The Penn soils are normally strongly acid and moderately low in fertility. Except in severely eroded areas they are moderate in available moisture capacity. The surface layer is loose and friable and is easily eroded, particularly in the steeper areas.

The Penn soils occur in level or gently sloping areas near the steeper, very shallow Klinesville soils and the deeper, moderately well drained Readington soils. In some depressions the Penn soils are intermingled with the somewhat poorly drained Abbottstown soils and the poorly drained Croton soils. They are also near small areas of Lehigh, Brecknock, and Reaville soils.

The Penn soils are extensive in Adams County and are important to the agriculture of the county. Most of their acreage has been cleared and is used for cultivated crops.

Penn silt loam, 0 to 3 percent slopes, moderately eroded (PeA2).—This soil is more nearly level and in places is slightly deeper to hard shale than the soil described as typical of the series. It has moderate to moderately low available moisture capacity and is easy to work, but it is susceptible to drought. Included in mapped areas are some uneroded or slightly eroded areas and a few severely eroded areas.

This soil is suited to drought-resistant varieties of corn, small grain, alfalfa, and orchardgrass. A cropping system of medium intensity that consists of a row crop, a small grain, and hay can be followed. If rainfall is adequate and management is good, favorable yields can be obtained. Erosion can be lessened by seeding a cover crop after corn or a spring-sown small grain is harvested. Contour stripcropping, supplemented with diversion terraces and sodded waterways, helps to control erosion in the more sloping areas. Large additions of fertilizer, lime, and organic material are needed if yields are to be satisfactory. (Capability unit IIe–3; woodland group 11; building site group 5)

Penn silt loam, 3 to 8 percent slopes, moderately eroded (PeB2).—This is the soil described as typical of the series. It has moderate or moderately low available moisture capacity.

This soil is easy to work, and if rainfall is adequate and management is good, it produces favorable yields of corn, small grain, alfalfa, orchardgrass, and other crops. Crops can be grown in a cropping system that consists of a row crop, a small grain, and 1 year of hay, or in another system of medium intensity. Drought-resistant varieties of plants should be used. Contour stripcropping, supplemented with diversion terraces and sodded waterways, is needed to control erosion. Also needed are additions of organic matter, which can be supplied by seeding green-manure crops, returning crop residue to the soil, and adding barnyard manure. (Capability unit IIe–3; woodland group 11; building site group 5)

Penn silt loam, 3 to 8 percent slopes, severely eroded (PeB3).—The plow layer of this soil is mostly red shaly material from the subsoil, for erosion has removed most of the original surface soil. Depth to hard shale is only about 12 to 16 inches.

As cropland, this soil has severe limitations and requires intensive conservation practices. Crops can be grown in a cropping system consisting of 1 year of a row crop, 1 year of a small grain, and 2 years of hay, or in another system of low intensity. Suitable crops are corn, small grain, alfalfa, and orchardgrass. Drought-resistant varieties of plants should be seeded, and additions of fertilizer and lime are needed. Cover crops and contour stripcropping, supplemented with diversion terraces and sodded waterways, are needed to help control erosion and to conserve moisture. Crop residue, green-manure crops, and barnyard manure will supply the needed organic matter and help to conserve moisture. Special practices are needed in some places to heal the existing gullies. Grazing should be carefully controlled and should not be permitted at all until late in spring, after the plant roots are well established. (Capability unit IIIe–3; woodland group 17; building site group 5)

Penn silt loam, 8 to 15 percent slopes, moderately eroded (PeC2).—This strongly sloping soil is shallower to hard shale than the soil described as typical of the series. Included in mapped areas are a few uneroded or slightly eroded areas.

This soil is easy to work, but it requires management that controls further erosion. A cropping system of low intensity should be used. One such system consists of a row crop, a small grain, and 2 years of hay. Cover crops and contour stripcropping, supplemented with diversion terraces and sodded waterways, are needed to help control erosion and to conserve moisture. (Capability unit IIIe–3; woodland group 11; building site group 6)

Penn silt loam, 8 to 15 percent slopes, severely eroded (PeC3).—This strongly sloping, severely eroded soil is shallower than the soil described as typical of the series. Depth to shale averages 12 to 14 inches. The plow layer is shaly and consists mostly of red subsoil material. This soil is droughty and is low in organic-matter content.

This soil can be used for crops, but it requires management that controls erosion, increases the content of organic matter, and conserves moisture. A suitable cropping system is a cultivated crop, a small grain, and 3 or more years of hay or pasture, or another system of very low intensity. Among the suitable crops are corn, small grain, birdsfoot trefoil, and orchardgrass. Yields of corn are low. Seeding should be in contour strips, and diversion terraces and grassed waterways are needed. Water must be diverted from the eroded areas. (Capability unit IVe–2; woodland group 17; building site group 6)

Penn silt loam, 15 to 25 percent slopes, moderately eroded (PeD2).—This moderately eroded, steep soil has lost as much as three-fourths of its original surface layer. Hard shale is at an average depth of 14 to 16 inches. Many areas are shaly. Included in mapped areas are a few areas that have slopes of more than 25 percent and a few areas that are severely eroded.

Crops can be grown in a cropping system consisting of a cultivated crop, a winter grain, and 3 or more years of hay, or in another system of very low intensity. Suitable crops are corn, small grain, birdsfoot trefoil, and orchardgrass. Corn yields are low. Drought-resistant varieties of plants should be seeded in narrow contour strips. Diversion terraces and sodded waterways may be needed to control erosion. (Capability unit IVe–2; woodland group 11; building site group 6)

Readington Series

The Readington series consists of moderately deep and deep, moderately well drained soils that formed over red, light-gray, or greenish-yellow soft shale, siltstone, or sandstone. Part of the underlying material weathered from rock, and part washed in from soils at higher elevations. These soils are in the central part of the county on gentle concave slopes, in drainageways, in depressions, and in the more nearly level areas among areas of the Penn, Lansdale, and Croton soils.

A soil typical of the Readington series has a dark reddish-brown silt loam plow layer about 10 inches thick. This layer is loose, friable, and rapidly permeable, and it is easy to work. The subsoil is dusky-red to dark reddish-brown fine silt loam that grades to silty clay loam. Reddish-yellow and yellowish-brown mottles occur at a depth of about 18 inches, and there is a dense compact layer at about 27 inches. This layer has platy structure and is firm when moist and sticky and plastic when wet. The subsoil is moderately permeable. Below a depth of 40 inches, the substratum consists of reddish-brown to dusky-red very shaly silty clay loam in which fragments of shale and sandstone make up 80 percent of the soil mass. It has fine mottles of yellowish brown. Depth to hard shale is about 46 inches.

In areas where they are near the Lansdale soils, the Readington soils are more sandy and are grayer than the soil described. In some places, both the surface layer and the subsoil are loam or sandy loam. The surface layer and the subsoil are dark reddish brown, yellowish brown, or grayish brown, depending on the color of the underlying material. Hard, red shale or sandstone is at a depth ranging from 28 to 60 inches and is deepest on the lower slopes or in depressional areas where soil material from adjoining slopes has been deposited.

These soils are normally strongly acid and are moderate to low in natural fertility. They have a seasonally high water table. Permeability is rapid in the surface layer and is moderate in the subsoil. The available moisture capacity is moderately high. These soils are eroded or are

susceptible to erosion, particularly in the more strongly sloping, cultivated areas. They are easy to work, and crops on them respond to additions of fertilizer and to other good management practices.

The Readington soils occur near the well-drained Penn and Lansdale soils, the somewhat poorly drained Abbottstown soils, the poorly drained Croton soils, the shallow Klinesville soils, and the shallow, sandy Steinsburg soils. The Readington soils are deeper than the Penn and Lansdale soils and contain less mottling in their subsoil than the Abbottstown soils.

The Readington soils are extensive in Adams County and occur mostly in fairly small areas, but they occupy a large, level area northeast of Bonneauville. About 90 percent of the acreage is cultivated.

Readington silt loam, 0 to 3 percent slopes (RoA).—This is the most extensive Readington soil in Adams County. It is the soil described as typical of the series. It is moderate to low in organic-matter content and in natural fertility. Runoff is slow, and the water table is seasonally high because drainage in the subsoil is impeded. Included in areas mapped along Conewago, Bermudian, Marsh, Rock, and Alloway Creeks are areas that are much more than 46 inches to bedrock. In these areas the substratum is at a depth of 40 to 60 inches and consists of dark reddish-brown, very gravelly silt loam that, in some places, contains layers of sand and gravel.

This soil is suited to most crops commonly grown in the county. Yields are favorable if management is good and provides for drainage and additions of manure, fertilizer, and lime. Alfalfa is fairly well suited if large amounts of fertilizer are added, but the plants are likely to be killed in winter. A suitable cropping system is 2 years of row crops, 1 year of a small grain, and 1 year of hay, or another system of high intensity.

On the more nearly level slopes, drainage can be provided by graded rows or graded strips. The more sloping areas can be drained by tiling, bedding, and open ditches if suitable outlets are available. Erosion generally is not a hazard, but in some areas at the foot of the slopes, there is a large amount of runoff from adjacent slopes. These areas can be protected by diversion terraces. (Capability unit IIw–1; woodland group 10; building site group 10)

Readington silt loam, 3 to 8 percent slopes, moderately eroded (RoB2).—This moderately eroded soil is shallower than the soil described for the series. Erosion has removed much of the original surface soil, and in some places the depth to hard shale or sandstone is not more than 24 inches. Because water moves slowly through the subsoil, runoff is rapid and adds to the erosion hazard. Included in areas mapped as this soil are severely eroded areas that have slopes of more than 8 percent.

To conserve moisture and maintain organic-matter content, a cropping system of medium intensity should be followed. One such system is a cultivated crop, a small grain, and hay, each grown for 1 year. Suitable crops are corn, small grain, orchardgrass, and moisture-tolerant varieties of alfalfa. Large amounts of amendments, particularly manure, are needed if yields are to be favorable. Seeding should be done in graded strips that are protected by diversion terraces and waterways. (Capability unit IIe–5; woodland group 10; building site group 10)

Readington and Wiltshire silt loams, 0 to 3 percent slopes (RdA).—These soils occur on gentle concave slopes of the uplands and in drainageways and depressions in nearly level areas where runoff is slow. In the vicinity of Fairfield, areas of these soils consist mostly of the redder Readington soils. In the southeastern part of the county, areas of these soils adjacent to the Conestoga soils consist mostly of the yellowish-brown Wiltshire soils, except where material has been washed in from Penn soils on adjacent uplands.

These soils are slower to dry in spring and after wet periods than are well-drained soils, but in dry periods they hold more moisture for the use of plants. Runoff is slow, and the water table is seasonally high, because drainage in the lower subsoil is impeded. Erosion is not likely.

Most of the acreage is used for crops or pasture. These soils are well suited to the crops commonly grown in the county except alfalfa and potatoes. The alfalfa is likely to be winterkilled. Moisture-tolerant varieties of legumes and grasses should be seeded. A suitable cropping system is a row crop, a cover crop, a row crop, a small grain, and hay. Drainage can be improved by bedding, open ditches, random tile, and graded rows. Water from higher areas can be kept from accumulating by diversion terraces. (Capability unit IIw–1; woodland group 7; building site group 10)

Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded (RdB2).—Except that the slopes are steeper and the soils are moderately eroded and are shallower, the soils of this mapping unit are like Readington and Wiltshire silt loams, 0 to 3 percent slopes. In the vicinity of Littlestown, areas of this mapping unit near the Conestoga soils consist mostly of the Wiltshire soils, except where these areas border the red Penn soils. Bordering the Penn soils, the areas consist mostly of Readington silt loam. Included in the mapping are slightly eroded areas, severely eroded areas, and some small loamy areas.

These soils should have a cover of vegetation most of the time that protects them from further erosion. Stripcropping or graded strips may be needed. Terraces to divert runoff from higher areas are needed in some places. Spots that remain wet can be drained with random tile. Crops can be grown in a cropping system that consists of a row crop, a cover crop, a row crop, a small grain, and hay. Although these soils may produce satisfactory yields of alfalfa, this crop is likely to be killed in winter. Potatoes are not well suited. (Capability unit IIe–5; woodland group 7; building site group 10)

Reaville Series

The Reaville series consists of shallow and moderately deep, somewhat poorly drained, medium-textured soils that developed on acid red shale and fine-grained sandstone. These soils are widely distributed in the more shaly areas of the central part of Adams County. Most of the acreage is in a belt just west of Gettysburg that extends through the county in a northeast-southwest direction. These soils have a small total acreage that is distributed in a few small and some fairly large areas on moderately rolling slopes and undulating ridgetops.

A soil typical of the Reaville series has a dark reddish-brown shaly silt loam plow layer about 8 inches thick. The plow layer is friable and has granular structure, but the surface layer in undisturbed areas tends to be platy.

The subsoil is reddish-brown shaly silt loam about 7 inches thick. The material in this layer can be crumbled easily in the hands; it is friable when moist and slightly sticky and slightly plastic when wet. The substratum consists of partly weathered red shale or hard siltstone. At a depth of 20 inches or more, the shale is hard and fairly impervious to water. Impeded drainage is indicated by the mottles just above the shale.

These soils are shaly silt loam in most places. The amount of shale increases with depth. Color ranges from reddish brown to gray and is reddest in areas where the underlying material is red shale. In some severely eroded areas all of the original surface soil has been removed. Depth to bedrock ranges from 6 to 30 inches.

These soils are strongly acid or medium acid and are low in natural fertility and available moisture capacity. They are wet during periods of high rainfall but are droughty in dry periods. Although water moves rapidly through the surface layer and the upper subsoil, the water is slowed by the impervious shale in the lower part of the subsoil, and the subsoil becomes saturated after heavy rains. Runoff from saturated soils has severely eroded the more strongly sloping areas.

The Reaville soils occur near the red shaly Penn soils, the moderately well drained Readington soils, and the somewhat poorly drained Abbottstown soils. They are also near the poorly drained Croton soils and the shallow shaly Klinesville soils.

Most of the small acreage of these soils in the county has been cleared and used for cultivated crops, but many areas are now idle. These soils are difficult to manage and produce low yields of crops. Most areas are too shallow for tile drainage.

Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded (ReA2).—This moderately eroded soil is more nearly level and slightly deeper to bedrock than the soil described for the series. It is susceptible to further erosion and, in dry periods, is susceptible to drought. Included in areas mapped as this soil are some less shaly areas, a few slightly eroded areas, and a few severely eroded areas.

Much of this soil is used for pasture and hay crops, and many areas are idle. Winter grain, birdsfoot trefoil, red clover, and timothy are commonly grown. A suitable cropping system is 1 year of a cultivated crop, 1 year of a small grain, and 2 or 3 years of hay. Drainage is generally needed if favorable yields are to be obtained. Corn can be grown, but yields are low. Graded strips, supplemented with diversion terraces where possible, are the most effective means for managing water. Spots that remain wet should be drained with tile. This soil is compacted and its structure is destroyed if grazing is permitted when it is wet. (Capability unit IIIw–2; woodland group 16; building site group 12)

Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded (ReB2).—This soil is slightly deeper and is less eroded than the soil described for the series. It tends to remain wet until late in spring, but becomes droughty during the normally dry summer and fall. Further erosion is likely, and natural fertility is low.

This soil can be used for cultivated crops, pasture, or hay, but deep-rooted, moisture-tolerant varieties of plants should be seeded. Suitable crops are small grain, birdsfoot trefoil, red clover, and timothy. Lime and fertilizer are needed. Diversion terraces and waterways may be used in some places. Spots that remain wet should be drained with tile where possible. A suitable cropping system is 1 year of a cultivated crop, 1 year of a small grain, and 2 or 3 years of hay. Pastures should not be grazed when the soil is wet. (Capability unit IIIw–2; woodland group 16; building site group 12)

Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded (ReB3).—This is the soil described as typical of the series. Erosion has removed most of its original surface soil, and in some places red shale is exposed. Shallow gullies have formed.

Because this soil is difficult to manage and produces low yields, many areas are idle. Crops can be grown only in a cropping system of very low intensity. Pasture is a better use than cropland. Bluegrass and birdsfoot trefoil are the principal hay and pasture plants grown. Seeding should be done in contour strips, and diversion terraces are needed to help control runoff and erosion. Pastures should not be overgrazed, and grazing should not be permitted when the soil is wet. (Capability unit IVe–4; woodland group 16; building site group 12)

Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded (ReC3).—This severely eroded soil is more strongly sloping than the soil described for the series. In most areas erosion has removed all of the original surface layer and has reduced the organic-matter content and the available moisture capacity. Runoff is rapid, and erosion is a serious hazard. A considerable amount of water seeps to the surface in winter and spring. Included in areas mapped as this soil are some areas that have slopes of more than 15 percent.

This soil is suited to hay or pasture. Crops can be grown in a cropping system that consists of a cultivated crop, a small grain, and 3 or more years of hay, or in another system of very low intensity. Grazing should be controlled. Where woodland is desired, adapted trees should be planted and the seedlings protected from fire and from grazing. (Capability unit IVe–4; woodland group 17; building site group 12)

Rohrersville Series

The Rohrersville series consists of poorly drained and somewhat poorly drained soils that formed in alluvium and colluvium that was brought in from areas of the Highfield, Myersville, and Edgemont soils. The alluvium and colluvium weathered from greenstone, metarhyolite, quartzite, and basalt. These soils occur in drainageways and depressions in the western and northwestern parts of the county.

A typical Rohrersville soil in a wooded area has a surface layer that is 12 inches thick. The top 3 inches of this layer is very dark-brown silt loam and is underlain by mottled light yellowish-brown and very dark grayish-brown silt loam. The lower 4 inches consists of mottled light yellowish-brown silty clay loam that is sticky and plastic when wet. The upper subsoil is yellow silty clay loam mottled with reddish yellow. A dense, compact layer occurs at a depth of 21 inches, and there is mottled yellow, gritty gravelly sandy loam at 48 inches. The subsoil is sticky and plastic when wet and is hard when dry. At a depth of 21 inches and below, the subsoil is slowly

permeable to roots and water. At a depth of 56 inches, the substratum is black stratified sand and gravel.

The surface layer ranges from silt loam to sandy loam and is gravelly to very stony in some areas. The subsoil ranges from silty clay loam to clay and contains varying amounts of sand and gravel. In some areas the subsoil is redder than that of the soil described. The surface layer and subsoil combined are 36 to 56 inches or more thick. The thickness of the colluvial or alluvial deposits ranges from a few feet to 50 feet. Mottling generally occurs within 10 inches of the surface. The very stony areas are mapped separately in this county.

The Rohrersville soils are near the shallow Catoctin soils, the well drained Highfield and Myersville soils, and the moderately well drained Buchanan soils.

Rohrersville silt loam, 0 to 3 percent slopes (RhA).—This is the soil described as typical of the series. It has a moderately slowly permeable subsoil and a seasonally high water table. It is normally strongly acid or medium acid. Erosion is not a hazard.

This soil is well suited to trees, and most of the acreage is woodland. Drainage, the main problem of management, can be improved by bedding, open ditches, or tile in the more nearly level areas and by graded strips, diversion terraces, and random tile lines in the more sloping areas. Corn, small grain, birdsfoot trefoil, ladino clover, and timothy can be grown. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or some other system of low intensity. This soil is not well suited to alfalfa, root crops, winter grain, or to other crops that are damaged by wetness. Because this soil puddles easily, it should be tilled only when the moisture content is good. Lime and fertilizer should be applied in amounts indicated by soil tests. (Capability unit IIIw–1; woodland group 13; building site group 12)

Rohrersville silt loam, 3 to 8 percent slopes (RhB).—This gently sloping soil has a moderately slowly permeable subsoil and a seasonally high water table. It is normally strongly acid or medium acid. Most areas are wooded and not eroded. Erosion is not a severe hazard, but a few eroded areas are included in areas mapped as this soil.

Drainage is the main problem of management. In areas that can be adequately drained, this soil is suited to corn, birdsfoot trefoil, ladino clover, and timothy. A suitable cropping system is a row crop, a small grain, and 2 years of hay, or another system of low intensity. Graded stripcropping, supplemented with diversion terraces and waterways, helps to dispose of water and to control erosion. Spots that remain wet should be drained with tile where possible. Bedding may be helpful in the more nearly level areas. Lime and fertilizer should be applied in amounts indicated by soil tests. (Capability unit IIIw–1; woodland group 13; building site group 12)

Rohrersville very stony silt loam, 0 to 8 percent slopes (RmB).—This soil has more stones and boulders on and in it than has the soil described for the series. Stones and boulders cover from 0.1 to 15 percent of the surface. Most of the acreage is wooded. This soil is suited to trees, wildlife habitat, or recreational areas, but the stones and wetness limit its suitability for other uses. Removing the stones and boulders would be difficult and expensive. (Capability unit VIIs–2; woodland group 13; building site group 12)

Rowland Series

The Rowland series consists of medium-textured, moderately well drained soils that have developed in alluvium washed mainly from areas of the Penn and Lansdale soils that generally are underlain by red shale and sandstone. The Rowland soils occur on flood plains throughout the central part of the county.

A soil typical of the Rowland series has a thick, reddish-brown silt loam surface layer that has medium or fine granular structure, is friable when moist, and has numerous pores. Mottled light-brown silt loam occurs at a depth of 15 inches, and weak-red silty clay loam is at 25 inches. The upper subsoil has thin platy structure and is friable when moist and slightly sticky and slightly plastic when wet. The lower subsoil has coarse prismatic structure that breaks to blocky structure in disturbed areas. It is mottled and is firm when moist and sticky and plastic when wet. At a depth of 48 inches and below, the underlying material is stratified reddish sand and gravel.

The surface layer is generally silt loam, but it is loam or sandy loam in some places. These soils are reddish brown to gray throughout the profile and are mottled with brown, red, brownish yellow, and pinkish gray. In places gravel or stratified sand occurs at a depth of 3 feet. Varying amounts of quartz pebbles, 1 to 2 inches across, occur on the surface and throughout the profile.

The Rowland soils are near the well drained Bermudian soils and the poorly drained Bowmansville soils. They are also near the Penn and Lansdale soils on some of the higher slopes.

Rowland silt loam (Ro).—This is the only Rowland soil mapped in Adams County. It occurs in level or nearly level areas and is susceptible to flooding about once in 3 or 4 years. Scouring is the only erosion hazard. This soil is strongly acid or medium acid. It has a moderately permeable subsoil and a seasonally high water table.

Drainage is the main problem of management. In most areas drainage can be improved by laying tile and building diversion terraces. A suitable cropping system is 2 years of row crops, 1 year of a small grain, 1 year of hay, or another system of high intensity. Suitable crops are corn, small grain, red clover, and timothy. For protection from scouring during floods, cover crops should be planted and left on the surface until it is plowed into the soil. (Capability unit IIw–2; woodland group 2; building site group 13)

Steinsburg Series

The Steinsburg series consists of moderately deep or deep, well-drained soils that formed on gray, brown, yellow, or pink sandstone and shale. These soils occur in the east-central part of the county on sharp breaks of slopes, on narrow ridges, and on fairly small mounds. They are shallow to the strongly weathered, loose, sandy material.

A moderately eroded, moderately sloping Steinsburg soil that is typical of the series has a dark grayish-brown sandy loam plow layer about 7 inches thick. This layer has weak, fine, granular structure and is loose when dry and very friable when moist. Water moves rapidly through the plow layer, which can be easily worked soon after a rain. The upper subsoil is dark-brown sandy loam about 4 inches

thick. It has fine granular structure and is loose when dry, friable when moist, and slightly plastic when wet. The lower subsoil is very gravelly and contains a large amount of soft sandstone fragments. It extends to a depth of 18 inches and is underlain by a substratum of olive-gray strongly weathered, loose, sandy material that is underlain, in turn, by soft sandstone.

The Steinsburg soils are generally grayish brown, but their color depends on the color of the underlying sandstone and has shades of yellow, olive, or pink in some places. The entire profile is generally sandy loam, though sand and gravel increase with depth. Layers in the subsoil are very weakly developed in some places and are missing in a few areas. In some areas a considerable amount of sandstone fragments and quartz pebbles occur on the surface and throughout the profile.

These soils are generally medium acid to very strongly acid. They are droughty because they are shallow and have low available water capacity. Natural fertility is low.

Steinsburg soils occur near the deeper Lansdale soils but have more coarse sand and fragments of sandstone throughout the profile. They also occur near the somewhat poorly drained Abbottstown soils, the moderately well drained Readington soils, and the poorly drained Croton soils. In places the Steinsburg soils are near the red, shaly Klinesville, Penn, and Reaville soils.

The Steinsburg soils are not extensive in Adams County. Because these soils generally are in small areas on narrow ridges and on mounds, they normally are used in the same way as are surrounding soils. In many places in freshly cultivated areas, the dry spots of these soils contrast sharply with the more moist surrounding soils. Crop and pasture on these soils produce low yields.

Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded (SsB2).—This soil is slightly deeper to weathered sandstone than the soil described for the series. It is shallow, droughty, and easily eroded. Included in mapped areas are nearly level areas that are only slightly eroded.

If this soil is cultivated, a cropping system of very low intensity should be followed. One such system is a row crop, a small grain, and 2 years of hay. Yields of corn are moderate to low because the soil is shallow and droughty. Winter grain, alfalfa, and orchardgrass can be grown if manure is added in large amounts and if moisture is conserved. Contour stripcropping, diversion terraces, and waterways are needed to control erosion. This soil is not well suited to pasture, but if deep-rooted, drought-resistant varieties of grasses and legumes are seeded, fair yields can be expected. Frequent topdressing and large additions of manure are needed. Pastures should be grazed lightly. If trees are planted on this soil, adapted species should be used. (Capability unit IIIe–4; woodland group 11; building site group 7)

Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded (SsB3).—This severely eroded soil has lost most of its original surface layer through erosion, and it is shallow and droughty.

This soil is not well suited to cultivated crops. It is best suited to hay, pasture, or trees. Suitable crops are small grain, birdsfoot trefoil, and orchardgrass. An occasional cultivated crop can be grown, but yields are very low. A suitable cropping system is a cultivated crop, a small grain, and 3 or more years of hay, or another system of very low intensity. Farming should be done in contour strips that are protected by diversion terraces and grassed waterways where needed. Lime and fertilizer should be applied in amounts indicated by soil tests. Pastures should be grazed lightly. (Capability unit IVe–2; woodland group 17; building site group 7)

Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded (SsC2).—This is the soil described as typical of the series. Included in mapped areas are small areas that are only slightly eroded.

This soil can be used for cultivated crops, but yields are low. A suitable cropping system is a cultivated crop, a small grain, and long-term hay or pasture. Suitable crops are drought-resistant varieties of corn, small grain, birdsfoot trefoil, and orchardgrass. Seeding should be done in contour strips that are protected by diversion terraces where practical. Apply lime and fertilize in amounts indicated by soil tests. Pastures should not be overgrazed or grazed early in spring. (Capability unit IVe–2; woodland group 11; building site group 8)

Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded (SsC3).—This severely eroded soil is shallower and droughtier than the soil described for the series. Erosion has removed more than three-fourths of the original surface layer.

This soil is suitable as pasture, woodland, or recreational areas. Pastures should be seeded to birdsfoot trefoil, orchardgrass, or other drought-resistant plants. Reseeding in contour strips helps to control erosion and conserve moisture until the plants are well established. Waterways and diversion terraces are needed in some places. Lime and fertilizer should be applied frequently. Grazing should be light. (Capability unit VIe-2; woodland group 17; building site group 8)

Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded (SsD3.—This severely eroded, steep soil is shallower than the soil described for the series. All of the original surface layer has been washed away in some places. Through this erosion, the soil has been made very droughty because much organic matter has been lost and the available moisture capacity is very low.

This soil is not suited to crops, is poorly suited to pasture, and should be planted to suitable trees or used for recreational areas. (Capability unit VIIe–1; woodland group 17; building site group 8)

Watchung Series

The Watchung series consists of deep, poorly drained soils that formed in material weathered from diabase. These soils range from medium acid to neutral. They occur in level or nearly level areas at the head of drainageways, along the base of slopes, and in other low areas. The largest areas occur in the south-central part of the county.

A Watchung soil typical of the series has a dark grayish-brown to black silt loam surface layer about 9 inches thick. The upper part of this layer is friable when moist, but the lower part is firm when moist and slightly sticky and plastic when wet. Brown and gray mottles occur just beneath the surface. The subsoil is gray to olive silty clay loam about 21 inches thick. It has prismatic structure and is very hard when dry and very sticky and very plastic when wet. Many prominent mottles of brown,

gray, and olive occur in the subsoil. The substratum, about 10 inches or more thick, is gritty silt loam that has many gray and olive mottles scattered throughout. It has weak, prismatic structure and is only slightly sticky and slightly plastic when wet. Varying amounts of disintegrated rock and sand occur in the substratum.

These soils are generally deep but are only moderately deep in some places. The subsoil ranges from silty clay loam to clay. Mottling begins anywhere between the surface and a depth of 8 inches. A few large diabase boulders occur in most areas. Some areas have a sandy subsoil and are better drained than the soil described. Some areas are very stony and are mapped separately in this county.

The Watchung soils occur near the well drained Montalto soils, the moderately well drained and somewhat poorly drained Mount Lucas soils, and the shallow Legore soils. The Watchung soils are wetter than all those soils and have a darker colored surface layer and a gray subsoil that is sticky and very plastic when wet.

Watchung silt loam, 0 to 3 percent slopes (WaA).—This is the soil described as typical of the series. It is slowly permeable and remains wet until late in spring.

This soil is suitable as pasture, woodland, or wildlife habitat. Drainage, the main problem of management, can be improved by bedding, random tile, and diversion terraces. If this soil is used for pasture, moisture-tolerant varieties of birdsfoot trefoil, ladino clover, or bluegrass should be seeded. To prevent trampling or compaction, grazing or other uses should not be permitted when the soil is wet. Suitable trees are red maple, pin oak, and white pine. (Capability unit Vw–1; woodland group 13; building site group 12)

Watchung silt loam, 3 to 8 percent slopes (WaB).—This soil is shallower than the soil described as typical of the series. It has a slowly permeable subsoil and remains wet for much of the year. Seepage from higher slopes is considerable, but the risk of erosion is only slight.

This soil is suited to pasture or trees. Moisture-tolerant grasses and trees should be planted. Birdsfoot trefoil, ladino clover, and bluegrass are suitable pasture plants. Drainage can be improved by bedding, random tile, and diversion terraces. Grazing or tilling should not be permitted when this soil is wet. (Capability unit VIw–1; woodland group 13; building site group 12)

Figure 13.—An area of Watchung very stony silt loam. The soil in the background is Montalto very stony silt loam.

Watchung very stony silt loam, 0 to 8 percent slopes (WcA).—This soil has more stones and boulders on the surface and throughout the profile than the soil described for the series. Diabase stones and boulders make up 10 to 35 percent of the profile (fig. 13). In many areas the boulders are 3 feet or more across.

This soil is best used as woodland, for wildlife habitat, and for recreational areas. It is generally too wet and too stony for other uses. Clearing away the stones, boulders, and trees would not be economically feasible. (Capability unit VIIs–2; woodland group 13; building site group 12)

Wehadkee Series

The Wehadkee series consists of deep, poorly drained soils on the flood plains along the major streams in the southeastern and central parts of the county. These soils formed in alluvium that washed from areas underlain by granite, gneiss, schist, diabase, quartzite, and other crystalline rocks.

A soil typical of the Wehadkee series has a very dark grayish-brown silt loam surface layer about 5 inches thick. This layer has coarse granular structure and is slightly sticky and slightly plastic when wet. The subsoil is silty clay loam that is 32 inches or more thick and is mottled but is dominantly gray or olive. The subsoil has weak, coarse, prismatic structure that breaks to platy structure. It is hard when dry and sticky and very plastic when wet.

The Wehadkee soils vary considerably in color and texture, depending on the origin of the sediments from which they were formed. In Adams County, their surface layer generally is silt loam, but many areas have thin sandy deposits on the surface. The surface layer ranges from dark grayish brown to light brownish gray, and the subsoil from mottled light gray to mottled gray or olive. The subsoil ranges from silty clay loam to clay. Mottling ordinarily begins at a depth of 7 inches but may begin anywhere between the surface and a depth of 12 inches. In many low spots, mottling begins at the surface, and the entire profile is very dark gray or olive. Some areas are stony.

These soils range from strongly acid to neutral. They are slowly permeable and have a seasonally high water table.

The Wehadkee soils occur near the Chewacla soils but are more poorly drained than those soils and are grayer throughout. In some places the Wehadkee soils are near the Watchung, Worsham, and Lehigh soils.

Wehadkee silt loam (Wd).—This is the soil described as typical of the series. It is subject to flooding, and in some places scouring causes considerable damage. This soil has a moderate to moderately high capacity for storing moisture and nutrients that plants can use. The water table is high for much of the year.

Wetness is the main limitation. This soil is best suited to pasture or woodland, but if it is properly drained, crops can be grown. Drainage can be improved by bedding, surface ditches, and random tile. Adding manure and returning crop residue to the soil help to reduce scouring. Moisture-tolerant varieties of plants should be seeded. (Capability unit IIIw–3; woodland group 3; building site group 13)

Wiltshire Series

The Wiltshire series consists of moderately well drained, medium-textured soils that formed in material weathered from limestone and calcareous schist and shale. These soils occur mainly in the eastern part of the county.

A soil typical of the Wiltshire series has a grayish-brown, friable surface layer that is about 12 inches thick and is easy to work. This layer has fine granular structure that tends to be platy in the lower part. The subsoil has moderate subangular blocky structure. The upper subsoil is brown silt loam, but the lower subsoil is finer textured and is sticky and plastic when wet. Faint mottles occur at a depth of 18 inches. The substratum is at a depth of 48 inches and consists mostly of partly weathered fragments of calcareous shale, schist, or limestone. It is yellowish mottled with reddish brown.

The surface layer is generally silt loam, but in a few places it is loam. The subsoil is also generally silt loam, but in some places it is silty clay loam or clay loam. Depth to mottling ranges from 15 to 30 inches. In some places thin deposits of soil material have washed in from other areas.

These soils are slightly acid or moderately acid. They have moderately high available moisture capacity. These soils are slightly eroded in the level to gently sloping areas and are moderately eroded in the more strongly sloping areas. They are susceptible to further erosion.

The Wiltshire soils occur near the moderately well drained Readington soils, the well drained Conestoga soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils. In the Fairfield Valley, small areas of Wiltshire soils are near the well-drained Athol soils.

The Wiltshire soils are not extensive in Adams County. They are easy to manage, and under good management produce satisfactory yields. In this county areas of Wiltshire soils are mapped only in undifferentiated units with areas of Readington soils.

Worsham Series

The Worsham series consists of deep, poorly drained soils that formed in material weathered from soft micaceous schist, phyllite, and slate. Some of this material washed in from higher areas. These soils are of small extent in this county and occur only in the extreme southeastern part. They occupy the more nearly levely areas in depressions, at the foot of slopes, and at the head of drainageways.

A soil typical of the Worsham series has a light olive-brown silt loam plow layer about 9 inches thick. This layer has coarse granular structure that breaks to weak, fine, granular structure. It is loose when dry, friable when moist, and slightly sticky when wet. The subsoil is olive-gray silty clay, clay loam, or clay. It has fairly platy structure and is very sticky and plastic when wet. Common, dark-red mottles begin at a depth of about 9 inches, but the lower subsoil is mottled with yellow and gray. The substratum is at a depth of about 36 inches and consists of partly weathered fragments of schist.

The surface layer ranges from olive brown to light gray, and the subsoil ranges from olive gray to grayish brown. In most areas a few inches to 2 feet of colluvial material has accumulated on the surface. These soils contain a large amount of mica where they were derived mainly from schist. In some areas fragments of quartzite occur throughout the profile.

The Worsham soils occur near the well drained Manor soils, the moderately deep, well drained Glenelg soils, and the moderately well drained Glenville soils.

Worsham silt loam, 0 to 3 percent slopes (WoA).—This is the soil described for the series. It has a slowly permeable subsoil, and in many places water seeps in from adjoining slopes. Drying out in spring is slow. Wetness is the main limitation, and drainage is difficult. The risk of erosion is slight. This soil is strongly acid or medium acid.

This soil is best suited to pasture, as woodland, or for wildlife habitat. Areas used for pasture and hay should be drained and seeded to moisture-tolerant varieties of birdsfoot trefoil, ladino clover, and bluegrass. The organic-matter content should be maintained. Bedding and diversion terraces are the most effective means of drainage. Open drains can be used if suitable outlets are available. Because the subsoil is slowly permeable, tile drains are not effective. This soil is compacted and its structure is destroyed if it is grazed or otherwise used when it is wet. (Capability unit Vw–1; woodland group 13; building site group 12)

Worsham silt loam, 3 to 8 percent slopes (WoB).—This soil is a little better drained than the soil described for the series, and it is more likely to erode in the more sloping areas. It has a slowly permeable subsoil and a fairly high water table, and it remains wet until late in spring. Some areas are slightly eroded and are susceptible to further erosion if they are left bare. Acidity is strong or medium.

Drainage is the main problem of management, but it can be improved by bedding, open drains, diversion terraces, and random tile. Pasture, woodland, and wildlife habitat are suitable uses. Moisture-tolerant varieties of plants should be selected for planting. This soil is compacted and its structure is destroyed if it is grazed or otherwise used when it is wet. (Capability unit VIw–1; woodland group 13; building site group 12)

Formation and Classification of the Soils

This subsection, after discussing the factors of soil formation, tells how soils are formed. The soils are then placed in two systems of classification, and the great soil groups and soil series in the county are described.

Factors of Soil Formation

Soils are mixtures of varying proportions of weathered rock, minerals, organic matter, water, and air. In soils, more or less distinct layers, or horizons, have formed as a result of the interaction of soil-forming factors. The important factors of soil formation are the parent material, the climate, the relief or lay of the land, the plants and animals on and in the soil, and time. The kind of soil that forms in any given place depends on the interaction of these factors.

In Adams County the characteristics of the *parent material* have an important effect on the kinds of soil that

form. For example, Penn soils have red colors that were inherited from their parent material of red shale. Steinsburg soils are low in content of clay because their parent material is coarse textured and resistant to weathering. The character of the parent material influences the speed of weathering and the kind of changes that take place during weathering. Limestone weathers rapidly, but quartzite weathers slowly. Many characteristics of a soil can be traced directly to the parent material. These include the kind and quantity of clay, the amount of coarse fragments, color, natural fertility, and reaction.

Climate affects the formation of soils by influencing the rate of weathering and the decomposition of minerals. Rocks and minerals tend to weather more rapidly and more completely in a warm climate than in a cold one. Moisture and temperature influence the kinds of vegetation that grow, and the vegetation, in turn, affects the characteristics of the soils. In Adams County soils developed under forest vegetation and were subject to moderate leaching. Many of the soils have podzolic characteristics that indicate development in a cool, humid climate.

Relief affects the rate of surface drainage and the movement of water through the soil. The degree of geologic erosion that has taken place was determined, in part, by the rate of surface drainage. Drainage has also influenced the rate that rock has weathered and the depth of this weathering. In effect, relief creates microclimate within the climate of a large area. Nearly level soils, such as Croton silt loam, 0 to 3 percent slopes, accumulate water from adjacent slopes and therefore have wetter climate than the nearby sloping soils. Generally, steep soils, such as Edgemont very stony loam, 25 to 70 percent slopes, are shallower to bedrock than less sloping soils, because the steep soils have more rapid surface runoff. Relief also affects the amount of radiant energy absorbed by soils, and this energy, in turn, affects the native vegetation.

Plants and animals are active in the soil-forming processes, but changes resulting from their activity are difficult to measure. In this county the thin horizons of accumulated organic matter and the leached A2 horizons of soils that formed under forest vegetation contrast with the thicker horizons of accumulated organic matter and the less strongly leached horizons that formed under grasses. Insects and rodents have been active in mixing soil material and humus, but their effect on soil development has been negligible. In many areas man has altered or removed soil material by grading, by excavation, and by other activities.

The length of *time* that the factors other than time have been operating is indicated, to some extent, by the degree of development of the soil profile. Soils with little or no profile development are considered young. Alluvial soils are young soils. In this county differences in time have not been responsible for most of the differences in the kind and distinctness of horizons. Such differences have been caused mainly by varying combinations of parent material and relief.

How Soils Are Formed

Soils are formed as a result of physical weathering of parent rock, chemical weathering of rock fragments and organic matter, the transfer of materials, and gains and losses of organic matter and minerals.

Soil formation begins with physical weathering. Large pieces of rock are broken into smaller pieces by frost wedging, differential expansion, colloidal plucking, hydration, and other forces. The rocks and rock fragments are further reduced to the size of sand and silt particles. These particles form an unconsolidated layer of material in which plants can grow. Organic matter is added to the mineral material when plants and animals die.

The rock fragments and the organic matter are chemically weathered by solution, carbonation, oxidation, reduction, and the action of weak acids. Some of the rock fragments are reduced to the size of clay. By the chemical processes, nitrogen, phosphorus, potassium, calcium, magnesium, iron, and other elements are released in forms that plants can use. In a well-drained soil, colors of yellow, brown, and red may indicate the presence of iron as ferric oxides. Reduction of these oxides to ferrous oxides may lead to the loss of iron because ferrous oxides are more soluble.

The transfer of material from one part of the soil to another is common in most soils. Organic matter is suspended in solution and moved. In soils such as the Abbottstown, Buchanan and Legore, clay has been moved from the surface layer to the subsoil. Calcium, magnesium, iron, and other elements are leached from the surface layer and are held by clay in the lower part of the profile. Nutrients are absorbed by plant roots and stored in stems, leaves, and twigs of plants. When the plants decay, they return to the soil the elements they took from it.

Gains and losses cause differences in the soils. The soil gains materials in the form of organic matter returned by plants and in the form of minerals gained through the weathering of rock. The soil loses materials when the materials are dissolved and leached away in solution, when nutrients are removed by plants, when erosion removes soil particles, and when organic matter decomposes and gases escape.

As the soil develops, layers, called horizons, are formed. The horizons gradually develop characteristics that are recognizable and that distinguish one horizon from another.

Under forest vegetation, the first horizon to form is at the surface and usually is dark colored and organic. It is called the O horizon. Forming under this horizon is a dark-colored mineral horizon, called the A1 horizon. As soluble materials are removed from the upper part of the profile, a light-colored eluviated horizon usually develops under the A1 horizon. This layer, the A2 horizon, generally retains quartz and other resistant minerals. Under the A2 horizon, a more strongly colored B horizon generally develops. This horizon may or may not be finer textured than the surface horizons. It is formed by alteration in place or by the washing in, or illuviation, of clay, iron, aluminum, or other compounds that have been released from the upper part of the profile. Deeper in the profile, the B horizon is lighter colored than in the upper part and, in most places, is coarser textured. In its lowest part, the B horizon blends with the unconsolidated material weathered from bedrock or other parent material. This unconsolidated material, the C horizon, is generally made up of the same kind of material as that from which the soil developed.

Classification of the Soils

Soils are placed in narrow categories so that knowledge about them can be more easily applied in their use and management on farms. They are placed in broad classes to facilitate the study and comparison of large areas such as continents and countries. The soils in Adams County have been placed in two systems of classification. The older of these systems is better known and is described in the "1938 Yearbook of Agriculture" (*17*) and is modified by Thorp and Smith (*14*). The Sols Bruns Acides of this system have been described by Baur and Lyford (*4*). The newer classification is called a Comprehensive System of Soil Classification and is described in the publication popularly called the Seventh Approximation (*18*). In table 9 the 41 soil series of Adams County are placed in categories of both the old and the new systems of classification. Further study on the classification of some soil series is needed and may result in placing these series into subgroups other than those given in table 9.

Descriptions of the Great Soil Groups

An important class of the older classification is the great soil group. A great soil group consists of soils that are similar in several fundamental characteristics. These soils have the same kinds and numbers of horizons, but corresponding horizons may not be of the same thickness, and they may not be of the same degree of distinctness. Also, some characteristics of the soils in any given group may vary considerably and may resemble characteristics of other great soil groups. The soils in great soil groups that are similar to the soils in other great soil groups in significant characteristics are called intergrades.

Each great soil group represented in Adams County is described in the following pages.

Gray-Brown Podzolic soils

Gray-Brown Podzolic soils formed in forested, humid, temperate regions, particularly in areas where the parent material is high in bases. In their natural state, these soils have a thin layer of leaf litter over a thin layer of humus. They have a moderately leached A horizon. A leached A2 horizon is evident in uncultivated areas. The clayey B horizon contains more clay than the A horizon and is generally brown, yellowish brown, or reddish brown. These soils are so weathered that only a small amount of weatherable minerals remains in them. In Adams County the typical Gray-Brown Podzolic soils are in the Abbottstown, Hollinger, Legore, and Reaville series.

Some soils in the county have features of both the Gray-Brown Podzolic and the Planosol great soil group. Their horizon sequence is similar to that of typical Gray-Brown Podzolic soils, but their B horizon is similar to that of Planosols. The B horizon generally is gray, moderately fine textured or fine textured, and slowly permeable. In Adams County only the Lehigh series consists of Gray-Brown Podzolic soils that intergrade toward Planosols.

Some soils in the county have features that are characteristic of both the Gray-Brown Podzolic and the Red-Yellow Podzolic great soil groups. They have a horizon sequence similar to that of the typical Gray-Brown Podzolic soils, but their A1 horizon is thinner and their A2 horizon is more highly leached. These soils normally are more acid and more highly leached than typical Gray-Brown Podzolic soils, but they are not so acid nor so highly weathered as Red-Yellow Podzolic soils. In Adams County the soil series that are Gray-Brown Podzolic soils intergrading toward Red-Yellow Podzolic soils are the Athol, Birdsboro, Brecknock, Conestoga, Edgemont, Glenelg, Glenville, Highfield, Lansdale, Myersville, Penn, Readington, and Wiltshire.

Red-Yellow Podzolic soils

Red-Yellow Podzolic soils formed in forested, warm, temperate regions. In their undisturbed state, these soils have a thin, dark A1 horizon, a lighter colored A2 horizon, and a red B horizon that is higher in clay content and sesquioxides than the A horizon. These soils are more highly weathered and normally are more acid than Gray-Brown Podzolic soils. The clay minerals are mostly kaolinitic. In some places the lower subsoil is faintly mottled or variegated. Because weathering has been more intense, the solum of Red-Yellow Podzolic soils normally is thicker than that of Gray-Brown Podzolic soils. Also, Red-Yellow Podzolic soils formed in more siliceous materials. The Buchanan soils are the only typical Red-Yellow Podzolic soils in Adams County.

Some soils in the county have a horizon sequence that is similar to that of typical Red-Yellow Podzolic soils, but they intergrade toward Reddish-Brown Lateritic soils because most of the horizons are weakly expressed. The A1 horizon has a dark-brownish color, and the B horizon normally is dark red and fine textured. Generally, it is finer textured than the B horizon of typical Red-Yellow Podzolic soils. Reaction is medium acid or slightly acid. In eroded areas, the clayey subsoil is exposed and management is difficult. In Adams County the Red-Yellow Podzolic soils that intergrade toward Reddish-Brown Lateritic soils are in the Arendtsville, Montalto, and Mount Lucas series.

Sols Bruns Acides

Sols Bruns Acides developed in forested, humid, temperate regions. These soils are young, for relatively little weathering has taken place. They formed in silty or sandy material and generally have weak A and B horizons. The A horizon normally is thin, and the A2 and B1 horizons are weakly expressed. The B2 horizon contains little clay and is distinguished chiefly by color. It is slightly redder or browner than the A or C horizons, but there is little difference in color or texture between the A and the B horizons. Little or no clay has moved. In Adams County typical Sols Bruns Acides are only in the Manor series.

Some soils in the county have a horizon sequence similar to that of typical Sols Bruns Acides, but they are similar to Lithosols in some ways. In most places they are shallow or moderately deep over rock and have a thinner solum than have typical Sols Bruns Acides. Sols Bruns Acides that intergrade toward Lithosols generally are on steep slopes and have been strongly influenced by relief or parent material. They are low in bases and are normally acid. In Adams County, Sols Bruns Acides that intergrade toward Lithosols are in the Steinsburg and Catoctin series.

TABLE 9.—*Soil series classified according to old and new systems of classification*

Series	Old classification	New classification	
	Great soil group	Subgroup	Family
Abbottstown	Gray-Brown Podzolic	Aquic Fragiudalfs	Fine loamy, mixed, mesic.
Arendtsville	Rel-Yellow Podzolic (intergrading toward Reddish-Brown Lateritic).	Typic Normudults	Fine loamy, mixed, mesic.
Athol	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Alfic Normudults	Fine loamy, mixed, mesic.
Bermudian	Alluvial	Cumulic Haplorthents [1]	Fine loamy, mixed, acid, mesic.
Birdsboro	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Normudults	Fine loamy, mixed, mesic.
Bowmansville	Low-Humic Gley	Cumulic Normaquepts [1]	Fine loamy, mixed, acid, mesic.
Brecknock	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Mollic Normudalfs [1]	Fine loamy, mixed, mesic.
Buchanan	Red-Yellow Podzolic	Aquic Fragiudults	Fine loamy, mixed, mesic.
Catoctin	Sols Bruns Acides (intergrading toward Lithosols).	Ruptic Alfic Lithic Dystrochrepts.	Loamy skeletal, mixed, mesic.
Chewacla	Alluvial	Aquic Cumulic Haplorthents [1]	Fine loamy, mixed, acid, thermic.
Conestoga	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Alfic Normudults	Fine loamy, mixed, mesic.
Croton	Low-Humic Gley	Typic Fragiaqualfs	Fine loamy, mixed, mesic.
Dunning	Humic Gley	Typic Haplaquolls	Fine, mixed, noncalcareous, mesic.
Edgemont	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Normudults [1]	Fine loamy, mixed, mesic.
Glenelg	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Normudults	Fine loamy, micaceous, mixed, mesic.
Glenville	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Aquic Fragiudults	Fine loamy, mixed, mesic.
Guthrie	Planosols	Typic Fragiaquults	Fine silty, mixed, thermic.
Highfield	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Alfic Normudults	Fine loamy (coarse loamy), mixed, mesic.
Hollinger	Gray-Brown Podzolic	Alfic Normudults	Fine loamy, micaceous, mesic.
Klinesville	Lithosols (intergrading toward Sols Bruns Acides).	Lithic Dystrochrepts	Loamy skeletal, mixed, mesic.
Lamington	Low-Humic Gley	Typic Fragiaquults	Fine loamy, mixed, mesic.
Lansdale	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Alfic Normudults	Coarse loamy, mixed, mesic.
Lawrence	Planosols	Aquic Fragiudults	Fine silty, mixed, mesic.
Legore	Gray-Brown Podzolic	Typic Normudalfs	Fine loamy, mixed, mesic.
Lehigh	Gray-Brown Podzolic (intergrading toward Planosols).	Aquic Normudalfs	Fine loamy, mixed, mesic.
Lindside	Alluvial	Aquic Cumulic Haplorthents [1]	Fine silty, mixed, nonacid, mesic.
Manor	Sols Bruns Acides	Typic Dystrochrepts	Coarse loamy, micaceous, mesic.
Melvin	Low-Humic Gley	Cumulic Normaquepts [1]	Fine silty, mixed, nonacid, mesic.
Montalto	Red-Yellow Podzolic (intergrading toward Reddish-Brown Lateritic).	Alfic Normudults	Clayey, mixed, mesic.
Mount Lucas	Red-Yellow Podzolic (intergrading toward Reddish-Brown Lateritic).	Aqualfic Normudults	Fine loamy, mixed, mesic.
Myersville	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Alfic Normudults	Clayey, mixed, mesic.
Penn	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Normudalfs	Fine loamy, mixed, mesic.
Readington	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Fragiudalfs	Fine loamy, mixed, mesic.
Reaville	Gray-Brown Podzolic	Aquic Fragiudalfs	Fine loamy, mixed, mesic.
Rohrersville	Low-Humic Gley	Aquic Fragiudalfs	Fine loamy, mixed, mesic.
Rowland	Alluvial	Aquic Cumulic Haplorthents [1]	Fine loamy, mixed, acid, mesic.
Steinsburg	Sols Bruns Acides (intergrading toward Lithosols).	Typic Dystrochrepts	Coarse loamy, mixed, mesic.
Watchung	Planosols	Typic Ochraqualfs	Fine, mixed, mesic.
Wehadkee	Low-Humic Gley	Cumulic Normaquepts [1]	Fine loamy, mixed, acid, thermic.
Wiltshire	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Typic Fragiudalfs	Fine loamy, mixed, mesic.
Worsham [2]	Low-Humic Gley	Typic Ochraquults	Clayey, mixed, thermic.

[1] Name of subgroup in doubt and may be changed.

[2] The Worsham series has recently been classified in a thermic soil family. In later surveys in this latitude the Worsham series will be renamed Baile.

Lithosols

Lithosols are generally steep, and they have been strongly influenced by relief or parent material. They do not have clearly expressed morphology, for their soil material is a freshly, imperfectly weathered mass of rock fragments. These soils are shallow and lack distinct horizons. No typical Lithosols occur in Adams County.

Some soils in the county are similar to typical Lithosols, but in some ways they are also similar to Sols Bruns Acides. Like typical Lithosols, those Lithosols that intergrade toward Sols Bruns Acides are generally steep and have been strongly influenced by relief and parent material. They generally have a plow layer that is underlain by shattered or relatively solid bedrock. Little weathering has taken place, and coarse fragments make up much of the soil. Characteristic of the Sols Bruns Acides, however, is the presence of a thin B horizon in some places. In Adams County Klinesville soils are the only Lithosols intergrading toward Sols Bruns Acides.

Planosols

Planosols developed in level or nearly level areas of forested and grassland regions. They are characterized by a strongly illuviated, dense, compact B horizon. Planosols are normally acid. The B horizon is generally of a grayish color and is poorly drained. In Adams County the surface layer of Planosols is silt loam, and the B horizon is silty clay or clay loam. Planosols in the county are in the Guthrie, Lawrence, and Watchung series.

Low-Humic Gley soils

Low-Humic Gley soils are in level or nearly level areas where surface water has collected, or they are in wet areas where the water table is high. These soils have a dark-colored A horizon that is moderately high in organic-matter content and overlies a gray A2 horizon. The subsoil is generally fine textured. It is grayish brown to yellowish brown, prominently mottled with gray, brown, or reddish brown. The subsoil of the wetter soils is predominantly gray. Soils in this group are normally somewhat poorly drained or poorly drained. In Adams County the series classified as Low-Humic Gley soils are the Bowmansville, Croton, Lamington, Melvin, Rohrersville, Wehadkee, and Worsham.

Humic Gley soils

Humic Gley soils formed in wet, level or nearly level areas that receive much surface water and, in many places, are ponded. They are waterlogged much of the time. These poorly drained or very poorly drained soils have an A horizon that is thick and dark as a result of the large amount of organic matter that has accumulated in it. The subsoil is a neutral gray and has a few scattered mottles of reddish brown. The only Humic Gley soils in Adams County are in the Dunning series.

Alluvial soils

Alluvial soils occur along large streams and consist of transported materials that were recently deposited. These deposits may be uniform or stratified. They have been deposited so recently that soil-forming processes have not modified them appreciably, but in some places the surface layer is darkened by organic matter. In this county Alluvial soils consist of fairly uniform silt loam that has a few strata of clayey or gravelly materials. The Alluvial soils in the county are in the Bermudian, Chewacla, Lindside, and Rowland series.

Descriptions of the Soil Series

This subsection briefly discusses the soil series represented in Adams County and gives a detailed description of a profile of a soil typical of the series. In the section "Descriptions of the Soils," other information about the series is given and each soil mapped in the county is described.

In this subsection color is given for a moist soil. Some terms used in the subsection are defined in the Glossary, and others are defined in the "Soil Survey Manual" (*16*).

Abbottstown series

The Abbottstown series consists of moderately deep and deep, somewhat poorly drained soils that have a distinct fragipan. These soils are in the Gray-Brown Podzolic great soil group. Their B horizon is illuviated and shows an increase in clay. These soils formed on red sandstone and shale of the Heidlersburg and Gettysburg formations and on arkosic sandstone of the New Oxford formation. They occupy drainageways, depressions, and nearly level areas throughout the central part of the county. The native vegetation was forest of mixed hardwoods.

Abbottstown soils are near the shallow Klinesville soils, the moderately coarse textured Steinsburg soils, the moderately deep, well drained Penn soils, the moderately deep, well drained Lansdale soils, the moderately well drained Readington soils, and the poorly drained Croton soils. Abbottstown soils are deeper to hard shale than the nearby Reaville soils, but unlike those soils, have a fragipan. They are redder throughout than the Lehigh soils, which tend to be bluish and grayish. Mottling is nearer the surface in the Abbottstown soils than in the Readington soils.

Profile of Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded, in a cultivated field west of New Oxford:

Ap—0 to 8 inches, reddish-brown (5YR 4/3) silt loam; weak, very fine, granular structure; friable when moist; 10 percent shale fragments; pH 6.6 (limed); gradual, smooth boundary; 7 to 12 inches thick.

B1—8 to 12 inches, reddish-brown (5YR 4/3) silt loam; few black specks; weak, medium, platy structure breaking to fine subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 10 percent shale fragments; pH 6.2 abrupt, wavy boundary; 3 to 5 inches thick.

B2t—12 to 16 inches, reddish-brown (5YR 5/4) silt loam; few, fine, distinct mottles of grayish brown (10YR 5/2); many pores; weak, thin and medium, platy structure breaking to fine subangular blocky structure; firm when moist, sticky and plastic when wet; 10 percent shale fragments; thin, discontinuous clay films; pH 6.0; abrupt, wavy boundary; 3 to 5 inches thick.

Bx1—16 to 20 inches, strong-brown (7.5YR 5/6) silty clay loam; common, medium, distinct mottles of yellowish red (5YR 5/8) and few, common, distinct mottles of reddish gray (5YR 5/2); moderate, medium, platy structure breaking to moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; continuous clay films; 10 percent shale fragments; pH 6.0; abrupt, wavy boundary; 3 to 5 inches thick.

Bx2—20 to 25 inches, strong-brown (7.5YR 5/6) silty clay loam; many, medium, distinct mottles of reddish gray

(5YR 5/2) and yellowish red (5YR 5/8); moderate, medium, subangular blocky structure; very firm when moist, sticky and plastic when wet; continuous clay films; 10 to 15 percent shale fragments; pH 6.0; clear, wavy boundary; 3 to 7 inches thick.

B3—25 to 29 inches, reddish-brown (5YR 4/4) shaly, gritty silty clay loam; many, medium, faint mottles of light reddish brown (5YR 6/3) and red (2.5YR 4/8); moderate, medium, subangular blocky structure; firm when moist, slightly sticky and plastic when wet; 35 to 50 percent shale fragments; discontinuous clay films; pH 5.8; clear, wavy boundary; 3 to 6 inches thick.

C—29 to 36 inches +, dark reddish-brown (2.5YR 3/4) very shaly, gritty silty clay loam; common, fine and medium, distinct mottles of reddish gray (5YR 5/2) and faint red (2.5YR 4/8); discontinuous clay films; pH 5.8; 80 to 85 percent shale fragments.

The surface layer ranges from silt loam to loam. The loam occurs in small amounts in areas dominantly of the Lansdale soils that are underlain by the New Oxford formation. The surface layer ranges from dark reddish brown (5YR 3/2) to dark grayish brown (10YR 4/2). Areas of loam are grayer than areas of silt loam. The subsoil ranges from silty clay loam to clay loam and, in a few places, to sandy loam. It is dark reddish brown (5YR 3/2) to yellowish red (5YR 5/6) or grayish brown (10YR 5/2). Depth to mottling ranges from 10 to 15 inches. Hard shale or sandstone is at a depth ranging from 24 to 60 inches and is deepest on lower slopes where alluvial-colluvial material has been deposited.

Arendtsville series

Soils of the Arendtsville series are deep and well drained. They are Red-Yellow Podzolic soils that intergrade toward Reddish-Brown Lateritic soils. Arendtsville soils formed on gravelly, medium-textured material, that have mixed mineralogy. Their parent material was derived from Arendtsville fanglomerate, which consists of metarhyolite, metabasalt, serecitic schist, and some quartzite. Calcareous rocks occur in places. These soils are on the rolling to hilly eastern foot slopes of South Mountain in the north-central part of the county. They extend from the vicinity of Cashtown northeastward into York County. The native vegetation was forest of oak, chestnut, and hickory, but now the woodland contains white oak, red oak, tulip-poplar, wild cherry, hickory, and sassafras.

Arendtsville soils are near the Highfield, Myersville, Penn, and Montalto soils. They have a coarser textured, less sticky and less plastic B horizon than Montalto soils and contain more quartzite gravel and stones throughout the profile. The Montalto soils, in contrast, were derived from diabase. Arendtsville soils are deeper than the Myersville and Highfield soils and are much deeper than the Penn soils. They are redder than the Highfield soils.

Profile of Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded, in an orchard west of Biglerville (Laboratory No. S61Pa-1-8-(1-6) in tables 4 and 10):

Ap—0 to 9 inches, dark reddish-brown (5YR 3/4) gravelly loam; weak, fine, granular structure; friable when moist; 25 to 30 percent angular and rounded pebbles; pH 6.2 (limed); clear, smooth boundary; 7 to 11 inches thick.

B1—9 to 16 inches, reddish-brown (5YR 4/3) gravelly loam; weak, medium, subangular blocky structure breaking to granular structure; friable when moist, slightly sticky and slightly plastic when wet; 15 percent gravel; partial clay films around pebbles; pH 6.2; gradual, wavy boundary; 5 to 10 inches thick.

B21t—16 to 28 inches, dark reddish-brown (2.5YR 3/4) gravelly silt loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 15 percent gravel; thick, discontinuous clay films; few black coatings; pH 6.0; gradual, wavy boundary; 9 to 15 inches thick.

B22t—28 to 40 inches, dark-red (2.5YR 3/6), heavy gravelly silt loam; moderate, medium and coarse, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 5 to 10 percent gravel; thick, discontinuous clay films, few black coatings; pH 4.5; gradual, wavy boundary; 8 to 17 inches thick.

B3—40 to 53 inches, dark reddish-brown (2.5YR 3/4) very gravelly loam; weak, fine, subangular blocky structure breaking to granular structure; friable when moist, slightly sticky when wet; 30 percent gravel; few clay films, common black coatings; pH 4.7; gradual, irregular boundary; 9 to 17 inches thick.

C—53 to 68 inches +, reddish-brown (2.5YR 4/4) silty clay films on weathered fanglomerate; massive; friable when moist; pH 4.7.

Profile of Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded, in an orchard southwest of Arendtsville (Laboratory No. S61Pa–1–9–(1–7) in tables 4 and 10):

Ap—0 to 9 inches, dark-brown (7.5YR 3/4) gravelly loam; weak, fine, granular structure; friable when moist; 20 percent angular and rounded pebbles; pH 5.8 (limed); clear, smooth boundary; 8 to 10 inches thick.

B1—9 to 14 inches, reddish-brown (5YR 4/3) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 15 percent rounded and angular pebbles; thin, discontinuous clay films; pH 6.4; gradual, wavy boundary; 3 to 7 inches thick.

B21t—14 to 20 inches, yellowish-red (5YR 4/6) gravelly silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; 25 to 30 percent rounded and angular pebbles; thick, discontinuous clay films; pH 6.2; gradual, wavy boundary; 4 to 8 inches thick.

B22t—20 to 25 inches, yellowish-red (5YR 4/6) gravelly silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; 20 percent angular and rounded pebbles; pH 6.1; gradual, wavy boundary; 4 to 8 inches thick.

B23—25 to 37 inches, reddish-brown (2.5YR 4/4) gravelly silty clay loam; weak, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; 30 percent gravel; thick patches of clay films; pH 5.2; gradual, wavy lower boundary; 8 to 15 inches thick.

B3—37 to 53 inches, reddish-brown (2.5YR 4/4) very gravelly clay loam streaked with weak-red (2.5YR 4/2) clay; friable when moist, sticky streaks when wet; 70 percent pebbles and weathered materials; pH 4.4; gradual, wavy boundary; 12 to 20 inches thick.

C—53 to 73 inches +, reddish-brown (2.5YR 4/4) and weak-red (10R 5/3) weathered fanglomerate and residual clay; mottles of light gray (N 6/0); pH 4.2.

The surface layer is generally gravelly loam, but it is gravelly sandy loam to gravelly silt loam in some places, and in severely eroded areas it is silty clay loam. The B horizon is generally silt loam to gravelly silty clay loam or gravelly clay loam, but in a few places it is sandy clay loam. Fragments, ranging from pebbles to stones in size, cover 15 to 50 percent of the surface and make up 15 to 50 percent of the profile though in a few places the amount in the upper B horizon is less. The hue of the B horizon is generally 2.5YR but ranges to 5YR and 10R. The C horizon is thick, and depth to hard rock ranges from 5 to 20 feet. In areas where the Arendtsville soils merge with

the Penn, Readington, and Reaville soils, distinct amounts of red shale occur.

In uncultivated areas the Arendtsville soils have a dark-gray A1 horizon 1 to 3 inches thick and an A2 horizon 6 to 10 inches thick. The A horizon is coarser in texture than the underlying horizons. The plow layer ranges from dark brown to reddish brown and has a hue of 5YR to 7.5YR. The C horizon and the lower part of the B horizon generally are very strongly acid or strongly acid, but in areas where the underlying rock is somewhat calcareous they are medium acid.

Athol series

The Athol series consists of deep and very deep, well-drained soils. Athol soils are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. They formed on material weathered from red, calcareous conglomerate. The underlying limestone consists of a red, calcareous matrix containing gray and pink marble, dolomite, and limestone and some quartz gravel. In Adams County most areas of Athol soils are undulating to rolling and are near Fairfield. Smaller areas are in the extreme eastern part of the county in more rolling areas near York Springs and Pigeon Hills. The native vegetation was oak, hickory, walnut, and locust.

Athol soils are near the Penn and Arendtsville soils and like those soils have reddish colors. They are also near the somewhat poorly drained Lawrence soils and the poorly drained Guthrie soils. Athol soils are somewhat finer textured than Arendtsville soils and have a stronger B horizon that is less acid in the lower part. Athol soils resemble the Myersville soils but are deeper and developed from more calcareous material. They are deeper and much redder than the Highfield soils.

Profile of Athol gravelly silt loam in a cultivated field near Fairfield:

Ap—0 to 10 inches, brown (7.5YR 4/4) gravelly silt loam; weak, fine, granular structure; friable when moist; 15 percent rounded and semirounded quartz pebbles; pH 6.4 (limed); clear, smooth boundary; 8 to 11 inches thick.

A3—10 to 14 inches, reddish-brown (5YR 4/4) heavy gravelly silt loam; weak, fine, subangular blocky structure breaking to granular structure; friable when moist, slighty sticky and slightly plastic when wet; 15 percent quartz gravel; pH 5.6; abrupt, wavy boundary; 3 to 5 inches thick.

B21t—14 to 25 inches, reddish-brown (5YR 5/4) gravelly clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; 15 percent quartz gravel; thin clay films; pH 5.6; gradual, wavy boundary; 9 to 14 inches thick.

B22t—25 to 39 inches, reddish-brown (5YR 4/4) gravelly clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; 15 percent quartz gravel; thin clay films; pH 5.6; gradual, wavy boundary; 11 to 16 inches thick.

B23t—39 to 48 inches, reddish-brown (5YR 4/4) gravelly clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; 20 percent quartz gravel; thick, discontinuous clay films; pH 5.6; gradual, wavy boundary; 7 to 12 inches thick.

B3—48 to 64 inches, yellowish-red (5YR 4/6) gravelly clay loam; moderate, very fine, blocky structure; firm when moist, sticky and plastic when wet; 15 percent quartz gravel; patches of clay films; few black coatings; pH 6.2; gradual, wavy boundary; 12 to 20 inches thick.

C—64 to 70 inches, yellowish-brown (10YR 5/6) heavy gravelly silt loam; streaks of brownish yellow (10YR 6/6); massive; firm when moist, slightly sticky and plastic when wet; 30 percent gravel; pH 6.4; gradual, irregular boundary; 4 to 15 inches thick.

R—70 inches +, calcareous conglomerate.

The surface layer ranges from brown to reddish yellow and from silt loam to gravelly loam. Its hue is generally 7.5YR but ranges from 2.5YR to 10YR. The subsoil ranges from silty clay loam to loam and generally is gravelly. Coarse fragments make up 5 to 25 percent of the surface layer, and they increase in amount with depth. The gravel ranges from coarse to fine and is finest in areas where these soils are reddest. In some places the soil material is less red than in the profile described, particularly where the underlying conglomerate merges with limestone that contains no red shale.

Depth to bedrock varies considerably but is at least 40 inches in most areas and is about 70 inches in the Fairfield Valley. In most places the Athol soils in Adams County are deeper than the Athol soils elsewhere. In this county, the quartz pebbles in the profile probably washed from the mountain. The Athol soils generally range from medium acid to neutral, but in most places the upper B horizon is medium acid or strongly acid.

Bermudian series

The Bermudian series consists of deep, well-drained Alluvial soils on flood plains. These soils developed in sediments that washed mostly from Penn, Readington, and Lansdale soils, which are in higher areas. Bermudian soils occur on the first bottoms along the major streams of the county, generally in narrow bands next to the streambanks or away from the streams next to the terraces or uplands. These soils have been in place for only a short time and often receive new deposits from recurrent floods. Profile development is weak. In this county these soils are not extensive, and they generally occur in small areas. Native vegetation consisted of ash, maple, elm, walnut, locust, oak, and hickory, but more than half of the acreage has been cleared and is cultivated or in pasture.

Bermudian soils are the well drained members of the flood-plain sequence that includes the moderately well drained and somewhat poorly drained Rowland soils and the poorly drained and very poorly drained Bowmansville soils. Bermudian soils are redder than the Rowland and Bowmansville soils and lack mottling in the subsoil, and, unlike those soils, they dry out early in spring. Bermudian soils formed in more recently deposited material than the nearby Birdsboro soils and have a less well developed profile. Bermudian soils are flooded occasionally, but Birdsboro soils are seldom flooded.

Profile of Bermudian silt loam in a pasture east of Gettysburg:

Ap—0 to 10 inches, yellowish-red (5YR 4/6) silt loam; weak, fine, granular structure; very friable when moist; 5 percent gravel and shale fragments; pH 5.4; gradual, smooth boundary; 7 to 12 inches thick.

C1—10 to 18 inches, dark-red (2.5YR 3/6) shaly silt loam; weak, fine, subangular blocky structure; friable when moist; 15 percent shale fragments; pH 5.4; gradual, wavy boundary; 6 to 11 inches thick.

C2—18 to 38 inches, dark-red (2.5YR 3/6) very shaly silt loam; weak, fine, subangular blocky structure; friable when moist; 50 percent shale fragments; pH 5.2; gradual, wavy boundary; 18 to 23 inches thick.

C3—38 to 50 inches, dark-red (2.5YR 3/6) very shaly silt loam; 85 percent shale and siltstone fragments; silt in pockets and between fragments; pH 5.2; gradual, wavy boundary; 10 to 15 inches thick.
R—50 inches +, red, hard shale.

Silt loam is the only type mapped in this county, but in some areas the texture of the surface layer is slightly finer or coarser textured than silt loam. The B horizon may range from loam to heavy silt loam. In many places mottling is at a depth of about 36 inches. The surface layer ranges from yellowish red to dark reddish brown, and the subsoil ranges from dark red to dark reddish brown or yellowish red. Hue is generally 5YR, but in a few places the profile has a purple cast. Fine to medium fragments of red shale and rounded pebbles occur on the surface and throughout the profile, and they generally increase in amount with depth. In places beds of stratified sand or gravel occur at a depth of 2 to 3 feet. Except in areas where the bedrock contains a considerable amount of calcium or magnesium carbonate, the Bermudian soils are strongly acid.

Birdsboro series

Soils of the Birdsboro series occur on terraces and are deep and well drained. They are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Their B horizon shows a moderate increase in clay. Although these soils are young and have a weakly developed profile, they are older and more strongly developed than soils on flood plains. Birdsboro soils formed in sediments that washed from soils derived from red sandstone and shale of Triassic age. Most of the parent material was washed from areas of Penn, Readington, and other soils nearby. Birdsboro soils occupy nearly level to moderately rolling terraces near the larger streams of the county. They are above the flood plain on high bottoms along Conewago, Bermudian, Latimore, Marsh, Rock, and Alloway Creeks and other streams. The native vegetation consisted of mixed hardwoods, mostly oak and hickory.

Birdsboro soils are near the moderately well drained Readington soils, the poorly drained Lamington soils, and the well drained Bermudian soils. They are more strongly developed than the Bermudian soils because they are above the level of floodwaters. Birdsboro soils are better drained than Readington soils, have a redder subsoil, and lack mottling in the lower subsoil.

Profile of Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field north of Hunterstown:

Ap—0 to 9 inches, reddish-brown (2.5YR 4/4) silt loam; weak, fine, granular structure; friable when moist; 10 percent medium and coarse gravel; pH 6.2 (limed); clear, smooth boundary; 7 to 10 inches thick.
B1—9 to 15 inches, yellowish-red (5YR 4/6) gravelly silt loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and nonplastic when wet; 15 percent quartz gravel and stones; pH 5.8; clear, wavy boundary; 4 to 8 inches thick.
B2t—15 to 30 inches, red, (2.5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 5 percent quartz stones and gravel, and 5 percent shale fragments; pH 5.2; clear, wavy boundary; 12 to 17 inches thick.
B3—30 to 42 inches, dark-red (10R 3/6) very shaly silt loam; moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; 2 percent rounded pieces of gravel, and 65 percent fragments of shale and siltstone; pH 5.2; gradual, wavy boundary; 9 to 15 inches thick.
C—42 to 54 inches, dark-red (10R 3/6) silt on and between coarse fragments; pH 5.4; 85 percent weathered fragments of shale and siltstone.
R—54 inches, hard shale.

The surface layer ranges from silt loam to loam and from brown or reddish brown to yellowish red. The subsoil ranges from yellowish red to dark reddish brown or dark red and from silt loam to silty clay loam. Ordinarily, the solum is between 36 to 45 inches thick, but in some places it is 70 inches thick or more. Pebbles and cobblestones of quartz and sandstone make up 5 to 15 percent of the surface soil and 60 to 70 percent of the subsoil. The shale fragments in the subsoil vary in amount. The Birdsboro soils are normally strongly acid, but they are neutral where limestone or diabase is near the surface.

Bowmansville series

The Bowmansville series consists of Low-Humic Gley soils on poorly drained flood plains that are subject to flooding. These soils developed from alluvium washed mostly from areas underlain by red shale and sandstone. They have a weakly developed profile and a water table that is seasonally high.

Bowmansville soils are somewhat poorly drained or poorly drained members of the flood-plain sequence that includes the well drained Bermudian soils and the moderately well drained Rowland soils. Bowmansville soils are redder and more acid than the Melvin soils and developed from alluvium derived from sandstone and shale rather than from limestone. In this county the Bowmansville soils are inextensive and are of little importance to farming.

Profile of Bowmansville silt loam in a pasture south of York Springs:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/2) silt loam; few, fine, faint mottles of reddish brown (5YR 4/4); weak, fine, subangular blocky structure breaking to fine granular structure; friable when moist, slightly sticky and slightly plastic when wet; pH 6.4; clear, smooth boundary; 7 to 10 inches thick.
C1g—8 to 18 inches, dark reddish-gray (5YR 4/2) silt loam; common, fine and medium, faint mottles of yellowish red (5YR 4/6); moderate, medium, prismatic structure breaking to moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; thin, discontinuous clay films; pH 6.2; gradual, wavy boundary; 8 to 13 inches thick.
C2g—18 to 38 inches, dark reddish-gray (5YR 4/2), gritty silt loam; common, fine and medium, faint mottles of yellowish red (5YR 4/6); weak, medium, prismatic structure breaking to subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; patches of clay films; pH 5.6; gradual, wavy boundary; 7 to 12 inches thick.
IIC3—38 to 42 inches, stratified gravel; pH 5.6.

The surface layer generally ranges from silt loam to gravelly loam, but there are a few areas of sandy loam. The color of the Bowmansville soils and the intensity of mottling vary according to texture and to the depth to the water table. The coarser textured soils are lighter in color, and generally the darker or grayer soils occur where the water table is high. The surface layer ranges from reddish brown to dark reddish gray, and the subsoil ranges from mottled reddish gray to brownish gray or dark gray. Varying amounts of sand and gravel occur throughout the profile.

Brecknock series

The Brecknock series consists of moderately deep or deep, well-drained Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Brecknock soils developed in material weathered from metamorphosed shale and sandstone that has been changed to grayish or bluish porcelanite by the heat and pressure from diabase intrusions. They occur on fairly level or undulating ridges and gently sloping hillsides.

Brecknock soils are adjacent to the diabase dikes that penetrate the sandstone and shale in the central part of the county. These soils are also near the moderately well drained or somewhat poorly drained Lehigh soils and the poorly drained Croton soils. In most places they occur as narrow bands between the Penn and Lansdale soils and the Legore and Montalto soils. Brecknock soils are less red throughout than the Penn soils and are grayer and more silty than the Lansdale soils. The Penn and Lansdale soils were derived from sandstone, siltstone, and shale that have not been metamorphosed. Brecknock soils are less red, more clayey, and more acid than the Montalto and Legore soils, which developed from diabase.

Profile of Brecknock silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field south of Gettysburg (Laboratory No. S61Pa-1-15-(1-5) in tables 4 and 10):

Ap—0 to 9 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 10 to 15 percent weathered fragments of shale; pH 6.9 (limed); abrupt, smooth boundary; 8 to 10 inches thick.

B21t—9 to 14 inches, dark-brown (10YR 3/3) channery clay loam; weak, fine and medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 25 percent weathered fragments of shale; thin, partial clay films; pH 6.8; clear, wavy boundary; 3 to 7 inches thick.

B22t—14 to 22 inches, dark-brown (10YR 3/3) channery silt loam; streaks of strong brown (7.5YR 5/6) and gray (N 5/1); moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; partial clay films; 35 to 40 percent weathered fragments of shale; pH 5.2; clear, wavy boundary; 6 to 10 inches thick.

B3—22 to 28 inches, dark-brown (10YR 3/3) channery loam; streaks of yellowish brown (10YR 5/6) and bluish gray (5B 5/1); moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; thin clay films; 40 percent weathered fragments of shale; pH 5.1; clear, wavy boundary; 4 to 12 inches thick.

C—28 to 38 inches, dark grayish-brown (10YR 4/2) weathered porcelanite; silty clay coatings and very dark gray fragments; pH 5.0.

R—38 inches +, dark-gray porcelanite.

Profile of Brecknock silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field northeast of Gettysburg (Laboratory No. S61Pa-1-14-(1-6) in tables 4 and 10):

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 5 to 10 percent coarse fragments; pH 6.4 (limed); clear, smooth boundary; 4 to 7 inches thick.

A3—6 to 10 inches, dark-brown (10YR 4/3) silt loam; weak, fine, subangular blocky structure breaking to granular structure; friable when moist, slightly sticky and slightly plastic when wet; thin, discontinuous clay films; 5 to 10 percent coarse fragments; pH 7.0; clear, wavy boundary; 3 to 5 inches thick.

B1—10 to 14 inches, dark-brown (10YR 4/3) silt loam; streaks of reddish yellow (5YR 7/8); moderate, medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; thin, discontinuous clay films; 5 to 10 percent coarse fragments; pH 7.1; clear, wavy boundary; 3 to 5 inches thick.

B2t—14 to 18 inches, brown (10YR 5/3) silt loam; streaks of yellowish brown (10YR 5/6) and gray (10YR 5/1); moderate, medium, subangular blocky structure; firm when moist, slightly plastic when wet; thin clay films; 5 to 10 percent coarse fragments; pH 7.0; gradual, wavy boundary; 3 to 7 inches thick.

B3—18 to 27 inches, light olive-brown (2.5Y 5/4), strong-brown (7.5YR 5/8), and gray (10YR 6/1) silt loam; streaks of dark gray (5Y 4/1) and dark bluish gray (5B 4/1); many black coatings; weak, thin, platy structure; firm when moist, slightly sticky and slightly plastic when wet; 10 to 15 percent coarse fragments; pH 6.8; gradual, wavy boundary; 6 to 12 inches thick.

C—27 to 44 inches, light olive-brown (2.5Y 5/4), strong-brown (7.5YR 5/8), and gray (10YR 6/1) silt loam; many streaks of dark bluish gray (5B 4/1); common dark-gray (5Y 4/1) and black coatings of iron and manganese; weak, thin, platy structure; 15 percent shale fragments; firm when moist; pH 6.9; abrupt, wavy boundary; 17 to 20 inches thick.

R—44 inches +, dark-gray (5Y 4/1), moderately hard porcelanite.

The surface layer is silt loam, loam, or channery silt loam. The texture and color of the Brecknock soils vary according to the nature of the parent material. These soils are lighter colored and coarser textured in areas where they derived from metamorphosed sandstone than they are in areas where they were derived from metamorphosed shale. Permeability is rapid in the surface layer and is moderate in the subsoil. Acidity ranges from strong to slight. The coarse fragments are weathered and soft, and most of them are easily cut with a knife or broken with the fingers, but they are harder at a depth of 30 to 38 inches. In many areas these soils are streaked with strong brown and other colors. The degree of base saturation is generally low, but it is relatively high in areas that have been limed and in areas influenced by underlying diabase or calcareous, metamorphosed shale.

Buchanan series

The Buchanan series consists of deep, moderately well drained Red-Yellow Podzolic soils that developed in colluvial and alluvial deposits. These soils occur on the lower slopes of drainageways and depressions in the mountainous areas of the western and northwestern parts of the county. Their parent material washed from soils derived from greenstone, metarhyolite, basalt, quartzite, and other felsitic or sericitic rock. The native vegetation was mostly forest consisting of white oak, hickory, wild cherry, beech, yellow-poplar, dogwood, chestnut oak, black oak, and locust.

Buchanan soils occur with the shallow Catoctin soils and the deep and moderately deep Highfield and Myersville soils. Buchanan soils are similar to the poorly drained Rohrersville soils.

Profile of Buchanan gravelly silt loam, 0 to 3 percent slopes, in an open area of woodland near Mount Hope:

A2—0 to 11 inches, brown (10YR 5/3) gravelly silt loam; weak fine, granular structure; very friable when moist; 20 percent coarse fragments; pH 5.2; strongly acid; clear, smooth boundary; 9 to 12 inches thick.

B21—11 to 17 inches, yellowish-brown (10YR 5/6) gravelly loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 20 percent coarse fragments; pH 5.4; clear, smooth boundary; 5 to 8 inches thick.

B22t—17 to 37 inches, yellowish-brown (10YR 5/4) gravelly sandy clay loam; few faint mottles of pale brown (10YR 6/3); moderate, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; 25 percent coarse fragments; thin continuous clay films; few fine roots, pH 5.4; diffuse, smooth boundary; 15 to 25 inches thick.

Bx—37 to 44 inches, yellowish-brown (10YR 5/4) gravelly sandy clay loam; few, common, faint mottles of pale brown (10YR 6/3); moderate, coarse, prismatic structure breaking to moderate, medium, platy and subangular blocky structure; firm when moist, sticky and slightly plastic when wet; 40 percent coarse fragments; thin, patchy clay films; gravel and small stones common; pH 5.4; gradual, smooth boundary; 3 to 9 inches thick.

C—44 inches +, gravelly and stony sandy material; 95 percent coarse fragments; some brown, red, and gray mottled sandy clay material.

The surface layer ranges from gravelly silt loam to very stony silt loam and from brown to yellowish brown or pale brown. A fairly large amount of coarse fragments occurs on the surface and throughout the profile. The subsoil is sandy clay loam, clay loam, or silty clay loam. It ranges from yellowish brown (10YR 5/6 to 5/8) to yellowish red (5YR 5/6) and has some brownish-yellow mottles and some faint, pale-brown or reddish-yellow mottles. Ordinarily, the subsoil is gravelly or very gravelly, but in some places it is stony. The Buchanan soils are strongly acid to medium acid. Their solum is 36 to 80 inches or more thick, and colluvial deposits are a few feet to 50 feet thick.

Catoctin series

The Catoctin series consists of well-drained soils that are shallow and moderately deep over material weathered from Pre-Cambrian rocks. These rocks are tough, massive greenstone and brittle metarhyolite from lava flows. Catoctin soils are Sols Bruns Acides that intergrade toward Lithosols.

Catoctin soils generally occupy the steeper slopes next to areas of deeper Highfield and Myersville soils, and they have less profile development than those soils. In many places Catoctin soils are severely eroded and tend to be droughty. They are near Buchanan and Rohrersville soils in places but are better drained than those soils and are deeper to bedrock.

Profile of Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded, in an orchard southwest of Cashtown:

Ap—0 to 9 inches, dark-brown (7.5YR 4/4) channery silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 20 percent channery fragments; pH 5.6; abrupt, clear boundary; 7 to 10 inches thick.

B2—9 to 16 inches, yellowish-brown (10YR 5/4) very channery silt loam; moderate, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; thin patches of clay film; pH 5.4; 70 percent channery fragments; diffuse, wavy boundary; 5 to 13 inches thick.

C—16 to 24 inches, brown (7.5YR 5/4) very channery silt loam; strong, medium, platy structure; 85 percent channery fragments of partly weathered metarhyolite and schistose metabasalt; silt loam coatings on fragments.

R—24 inches, hard, green schistose metabasalt.

The surface layer ranges from silt loam to channery silt loam and, in some places, is very stony. The subsoil generally has the same texture as the surface layer, but the subsoil is channery clay loam in a few places. It is dark brown to yellowish brown and is more yellowish in the lower part. The platy structure of the C horizon is inherited from the schist parent material. Because of variations in slope and erosion, the Catoctin soils vary widely within short distances. Any of the horizons may be thin or absent. In some places the surface layer rests directly on soft or hard rock. On the smoother, more nearly level ridgetops, these soils are deeper and more uniform than they are elsewhere. The Catoctin soils have a thin B horizon and, in some places, a very thin C horizon. Depth to bedrock ranges from 1 to 4 feet.

Chewacla series

The Chewacla series consists of deep, somewhat poorly drained or moderately well drained Alluvial soils on nearly level flood plains. The parent material of these soils consists mostly of sediments washed from diabase, phyllite, and schist that weathered in upland areas. Chewacla soils are in narrow valleys on first bottoms that are subject to flooding. In most places these soils developed under a cover of mixed hardwoods that included oak, ash, and elm.

Chewacla soils are the moderately well drained members of the drainage sequence that includes the poorly drained Wehadkee soils. Although the lower subsoil of Chewacla soils is mottled, these soils are better drained and less gray than the Wehadkee soils. They are similar to the reddish Rowland soils in drainage but are more yellowish and finer textured.

Profile of Chewacla silt loam in a pasture southeast of Gettysburg:

Ap—0 to 10 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 5 percent gravel; pH 6.2; clear, smooth boundary; 8 to 11 inches thick.

C1—10 to 20 inches, dark yellowish-brown (10YR 4/4) gravelly sandy loam; weak, fine, granular structure; friable when moist, slightly sticky and plastic when wet; 15 percent gravel; many pores; mica evident; pH 5.8; gradual, smooth boundary; 8 to 13 inches thick.

C2—20 to 38 inches, light olive-brown (2.5Y 5/4) gravelly loam; common, medium, distinct mottles of yellowish red (5YR 4/6) and few, fine, distinct mottles of pink (5YR 8/3); slightly platy structure breaking to weak and moderate, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; mica evident; black specks; thin, discontinuous clay films; 45 percent gravel; pH 6.4; gravel content increases with depth.

The surface layer ranges from dark brown to yellowish brown, and from silt loam to sandy loam. The subsoil ranges from brownish yellow to olive brown. The subsoil generally has the same texture as the surface layer, but in some places, lenses of heavy silt loam or silty clay occur. The content of mica is high where the soil material was derived from schist and is low where it was derived from diabase. Mottling generally begins at a depth of 20 inches, but it may begin at any depth between 16 and 30 inches. In the western part of the county, the parent material contains material weathered from metarhyolite and quartzite. Varying amounts of diabase boulders occur in some areas. The content of gravel varies greatly.

Conestoga series

The Conestoga series consists of deep, well-drained Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Conestoga soils developed in material that weathered from impure limestone and calcareous schist and shale. These soils extend from the vicinity of Littlestown northeastward to McSherrystown and then into York County. In the southernmost areas of these soils, slopes are gentle to moderate. Farther north, near Edgegrove and Conewago Chapel and just east of Centennial, slopes are moderately steep and low hills and ridges are conspicuous. The soils in the more northern areas are more eroded and shallower than those in the southern areas. The native vegetation on Conestoga soils was forest consisting of oak, hickory, and poplar.

Conestoga soils are near the shallow, well drained Hollinger soils, the moderately well drained Wiltshire soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils. Conestoga soils are deeper and generally less eroded than the Hollinger soils and have a finer textured B horizon. They are more yellowish than the Athol soils, which occur in Fairfield Valley.

Profile of Conestoga silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field near McSherrystown (Laboratory No. S61Pa-1–46 in table 4):

Ap—0 to 10 inches, pale-brown (10YR 6/3) silt loam; weak, fine, granular structure; very friable when moist; 5 percent coarse gravel consisting of chert and schist; a few quartz pebbles; pH 6.6 (limed); abrupt, smooth boundary; 9 to 11 inches thick.

B1—10 to 15 inches, brownish-yellow (10YR 6/8) silt loam; weak, fine, subangular blocky structure; very friable when moist; 5 percent coarse fragments; pH 6.4; clear, smooth boundary; 2 to 6 inches thick.

B22t—15 to 26 inches, brownish-yellow (10YR 6/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 5 percent coarse fragments; partial clay films; pH 6.0; gradual, wavy boundary; 9 to 14 inches thick.

B23t—26 to 34 inches, brownish-yellow (10YR 6/8) silty clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and slightly plastic when wet; 10 percent coarse fragments; thick, partial clay coatings on all peds; pH 5.8; gradual, wavy boundary; 5 to 10 inches thick.

B24t—34 to 42 inches, very pale brown (10YR 7/4) and yellowish-brown (10YR 5/8) shaly silty clay loam; strong, coarse, subangular blocky structure; hard when dry, firm when moist, sticky and slightly plastic when wet; 20 percent coarse fragments of quartz and weathered shale, mostly less than 1 inch in size; thick patches of clay film; pH 5.6; gradual, wavy boundary; 5 to 10 inches thick.

B3—42 to 52 inches, very pale brown (10YR 7/4) and strong-brown (7.5YR 5/6) very shaly clay loam; strong, coarse, subangular blocky structure; hard when dry, firm when wet; 75 percent fragments of quartz gray slate, and schist; thick patches of clay film on peds; black and yellow coatings on fragments; pH 7.0; gradual, wavy boundary; 8 to 15 inches thick.

C—52 to 64 inches, very pale brown (10YR 7/4) and strong-brown (7.5YR 5/6) weathered shale and schist; some quartz fragments; loamy material between fragments; weathered, fragmented material makes up 95 percent of horizon; pH 7.0.

R—64 inches +, hard, calcareous schist or shale.

The surface layer ranges from dark brown to yellowish brown, and the subsoil ranges from yellowish brown to light brownish gray. Hue ranges from 10YR in the upper horizons to 5YR in the lower horizons. The surface layer is generally silt loam, but in a few places it ranges to loam or shaly silt loam. The subsoil ranges from silty clay loam to clay loam and in places is shaly. The solum ranges from 40 to 70 inches in thickness. The substratum consists mostly of weathered impure limestone, weathered shale, or sandy material. In places the limestone is relatively pure. Varying amounts of chert, schist pebbles, fragments of shale, and other rock occur on the surface and throughout the profile.

Croton series

The Croton series consists of deep, poorly drained Low-Humic Gley soils that developed in material weathered from red and gray shale, siltstone, and sandstone. These soils formed in residual colluvial-alluvial material and are mostly well developed. The colluvial-alluvial material was transported from areas of Penn, Readington, Abbottstown, and Lansdale soils in the adjacent uplands. Croton soils occur in natural depressions, in drainageways, around the head of streams, and in other level or nearly level areas. In the lower B horizon, these soils have a dense, slowly or very slowly permeable layer that retards drainage and the penetration of roots. Native vegetation consisted of oak, hickory, and other moisture-tolerant hardwoods.

Croton soils occur near the shallow Klinesville soils, the moderately deep Penn soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, the sandy Steinsburg soils, the deep or moderately deep Lansdale soils, and the shallow to moderately deep Reaville soils. Croton soils are more poorly drained than the Brecknock soils and the moderately well drained and somewhat poorly drained Lehigh soils. They are deeper than the Reaville soils but have poorer drainage because of their higher content of clay and their fragipan.

Profile of Croton silt loam, 0 to 3 percent slopes, at the edge of a small woodlot south of Bonneauville:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure breaking to medium and fine granular structure; friable when moist, slightly sticky and slightly plastic when wet; many pores of all sizes; black specks in lower part of horizon; pH 5.4; clear, smooth boundary; 7 to 9 inches thick.

B1g—8 to 18 inches, gray (10YR 6/1) silty clay loam; many coarse, prominent mottles of yellowish brown (10YR 5/6); weak, medium, platy structure; hard when dry, slightly firm when moist, sticky and plastic when wet; many small pores; few fine roots; thin, continuous clay films; pH 5.4; gradual, smooth boundary; 6 to 12 inches thick.

Bx1g—18 to 31 inches, gray (10YR 6/1) clay loam; many, medium and coarse, distinct mottles of strong brown (7.5YR 5/8); moderate, coarse, prismatic structure breaking to moderate, thick, platy structure and strong, fine to medium, blocky structure; very hard when dry, very firm when moist, sticky and very plastic when wet; few fine roots; thick clay films; pH 5.4; gradual, wavy boundary; 11 to 16 inches thick.

Bx2g—31 to 36 inches, gray (10YR 6/1) clay loam; many, medium and coarse mottles of strong brown (7.5YR 5/8); moderate, coarse, prismatic structure breaking to moderate, thick, platy structure and strong, fine to medium, blocky structure; very hard when dry, very firm when moist, sticky and very plastic when wet; no roots, thick clay films; pH 5.4; gradual, wavy boundary; 2 to 7 inches thick.

B3—36 to 45 inches, red (2.5YR 4/6) to dark-red (2.5YR 3/6) clay loam; few, coarse, distinct mottles of gray (10YR 6/1) and pink (5YR 7/3); weak, coarse, prismatic structure breaking to moderate, thick, platy struc-

ture; slightly firm when moist, slightly sticky and slightly plastic when wet; some thick patches of clay films; no roots; pH 5.8.

C—45 to 55 inches +, dark-red (2.5YR 3/6) soft, partly weathered shale; silty clay loam coatings on weathered fragments.

The surface layer is dominantly silt loam, but in some areas near the Steinsburg and Lansdale soils it is silty clay loam. It ranges from gray to dark brown and generally has a hue of 10YR. In some areas the surface is covered with several inches of recent alluvium. The subsoil ranges from silt loam to silty clay loam or clay loam. The color of the subsoil varies widely and depends on the color of the parent material. In most places the subsoil ranges from gray to yellow or reddish yellow and is mottled with strong brown, gray, dark red, pink, reddish gray, dark gray, or olive, or with several of those colors. Mottling ordinarily begins at a depth of 8 to 12 inches, but it may begin any depth between the surface and 13 inches. A few areas are slightly eroded to moderately eroded. Depth to bedrock ranges from 3 to 5 feet but averages about 4½ feet. The Croton soils are normally strongly acid but are only slightly acid in areas influenced by limestone and diabase.

Dunning series

The Dunning series consists of very poorly drained Humic Gley soils on nearly level flood plains. Dunning soils formed in sediments that washed from uplands underlain by limestone and other calcareous rocks. They lie along streams in the Fairfield Valley and in the limestone areas of the eastern part of the county. They are susceptible to flooding and have a water table at the surface much of the year.

Dunning soils are near the moderately well drained Lindside soils and the poorly drained Melvin soils and have a finer textured, darker colored surface layer and poorer internal drainage than those soils. They have a darker colored surface layer and slightly finer texture than the Guthrie soils.

Profile of Dunning silty clay loam:

A1—0 to 11 inches, very dark gray (N 3/0) silty clay loam; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and olive gray (5Y 5/2); weak, medium to thick, platy structure; hard when dry, firm when moist, very sticky and very plastic when wet; pH 6.6; gradual, wavy boundary; 4 to 8 inches thick.

C1g—11 to 37 inches, very dark gray (5Y 3/1) silty clay; common, medium, distinct mottles of dark yellowish brown (10YR 4/4) and olive gray (5Y 5/2); massive; very hard when dry, very firm when moist, very sticky and very plastic when wet; thick, continuous clay films that have black specks; 10 percent gravel; pH 6.8; gradual, wavy boundary; 20 to 30 inches thick.

IIC2g—37 inches +, very dark gray (5Y 3/1) gravelly silty clay loam; many, medium, distinct mottles of dark yellowish brown (10YR 4/4), olive gray (5Y 5/2), light olive gray (5Y 6/2), and brown (7.5YR 5/4); massive; very hard when dry, very firm when moist, very sticky and very plastic when wet; thick, continuous clay films; black concretions; 15 to 35 percent gravel; pH 6.8.

The surface layer ranges from black to dark grayish brown. It is predominantly silty clay loam, but some areas are covered with recent deposits of coarser material. The subsoil ranges from mottled light gray to very dark olive gray and from silty clay to clay. Mottling ordinarily begins at the surface, but in some places, particularly in areas of recent alluvium, it begins at a depth of a few inches. Depth to gravel or hard rock ranges from 3 to 15 feet.

Edgemont series

The Edgemont series consists of deep and moderately deep, well-drained soils that developed in material weathered from quartz-schist, quartzitic sandstone, quartzite conglomerate, and some fairly pure quartzite. Edgemont soils are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Most areas of Edgemont soils are on moderately sloping to steep ridges in the extreme northern and western parts of the county. A small area occurs on the moderately sloping to steep parts of Pigeon Hills in the extreme eastern part of the county. In this area the quartzite is Chickies quartzite and contains basal Hellam conglomerate. Edgemont soils have a small total acreage in Adams County. Native vegetation consisted mainly of oak, hickory, and chestnut, but there were some dogwood, pine, and other trees. Most areas remain in hardwoods.

Edgemont soils occur near Highfield soils but are more yellowish brown and coarser textured. They are coarser textured than the nearby Myersville soils and have a less red subsoil. Edgemont soils are deeper than the Catoctin soils.

Profile of Edgemont channery loam, 3 to 8 percent slopes, in a wooded area in the Pigeon Hills:

A1—0 to 1 inch, very dark grayish-brown (10YR 3/2) channery loam; very fine granular structure; very friable when moist; 15 percent channery fragments; a few boulders; pH 4.8; abrupt, smooth boundary; 1 to 2 inches thick.

A2—1 to 9 inches, yellowish-brown (10YR 5/6) channery loam; weak, medium, subangular blocky structure breaking to granular structure; friable when moist; 15 percent channery fragments; pH 4.4; clear, wavy boundary; 6 to 8 inches thick.

B1—9 to 18 inches, yellowish-brown (10YR 5/4) channery silt loam; weak, medium, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; thin, partial clay films; 20 percent channery fragments; pH 4.6; clear, wavy boundary; 7 to 11 inches thick.

B21t—18 to 25 inches, yellowish-brown (10YR 5/4) channery clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; prominent clay films; 20 percent channery fragments; pH 4.6; clear, wavy boundary; 5 to 9 inches thick.

B22t—25 to 33 inches, yellowish-brown (10YR 5/6) channery clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and plastic when wet; prominent clay films; 25 percent channery fragments; pH 4.6; clear, wavy boundary; 6 to 9 inches thick.

C—33 to 45 inches +, light yellowish-brown (10YR 6/4) loam between coarse fragments; 85 percent fragmented rock; pH 4.6.

The surface soil ranges from very dark grayish brown to yellowish brown (10YR 5/6), and the subsoil ranges from yellowish brown to strong brown (7.5YR 5/6). The surface layer is generally channery loam, but it is silt loam, loam, or sandy loam in some places. The subsoil ranges from silt loam to clay loam. In some places the substratum consists of a mass of fractured quartzite and

a little fine soil material, but overlying the quartzite bedrock in other places is reddish silty clay or mottled red and gray to white material. Depth to quartzite ranges from 3 to 12 feet. The amount of fragmented rock on the surface and throughout the profile varies greatly.

Glenelg series

The Glenelg series consists of deep, well-drained soils that formed in material weathered from gray sericitic schist or phyllite. Glenelg soils are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Their solum generally is less than 30 inches thick. The schist underlying the Glenelg soils is fairly soft and sandy, and parts of it are micaceous. These soils occur on broad ridgetops in the extreme southeastern part of the county. Practically all areas have been cultivated for a long period. The native vegetation was a forest, mostly of oak that contained some chestnut, locust, dogwood, hickory, and poplar.

Glenelg soils are near the thin solum Manor soils, the moderately well drained Glenville soils, and the poorly drained Worsham soils. They are deeper and less channery than the Manor soils and are better drained and normally shallower than the Glenville and Worsham soils.

Profile of Glenelg silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field near the extreme southeastern corner of the county:

Ap—0 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable when moist; 15 percent coarse fragments; pH 6.2 (limed); abrupt, smooth boundary; 6 to 8 inches thick.

B1—7 to 12 inches, strong-brown (7.5YR 5/6) shaly silt loam; weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 15 percent coarse fragments; pH 5.2; abrupt, smooth boundary; 4 to 6 inches thick.

B2t—12 to 21 inches, yellowish-red (5YR 5/8) shaly silt loam; moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; 20 percent rock fragments; thin, discontinuous clay films; pH 5.2; clear, wavy boundary; 7 to 11 inches thick.

B3—21 to 26 inches, yellowish-red (5YR 5/8) shaly, gritty silt loam; moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; 40 to 50 percent schist fragments and mica flakes; thin, discontinuous clay films; pH 5.2; clear, wavy boundary; 3 to 8 inches thick.

C1—26 inches +, yellowish-red (5YR 5/8) and red (2.5YR 4/6) very shaly loam from highly decomposed schist; 60 to 80 percent schist fragments and mica flakes larger than 2 millimeters; pH 5.2.

The surface layer is dark brown to yellowish brown and has a hue of 10YR. It is silt loam in most places but ranges to gravelly or shaly loam. The subsoil is strong brown to yellowish red and has a hue of 7.5YR to 5YR. It is generally shaly silt loam to silt loam but in some places is silty clay loam or very shaly, micaceous clay loam. The subsoil contains varying amounts of mica and is underlain by hard schist or saprolite. The surface layer is 7 inches thick in most places, but it is as much as 8 inches thick in some places, and in others it has washed away. The B horizon ranges from 10 to 20 inches, and the C horizon is 20 to 30 inches from the surface. Fine fragments of quartz occur on the surface and throughout the profile in some places. The depth to hard bedrock ranges from 3 to 20 feet.

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Glenville series

The Glenville series consists of deep, moderately well drained soils that developed from weathered schist and phyllite. Some of the parent material washed in from soils at higher elevations. Glenville soils are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Glenville soils have a moderate to weak fragipan. The native vegetation of mixed hardwoods has been mostly cleared, and these soils are now used mainly for crops, but in some areas there is a second growth of elm, maple, willow, and alder.

Glenville soils are near the thin solum Manor soils, the moderately deep solum Glenelg soils, and the poorly drained Worsham soils. They are deeper and less well drained than the Manor and Glenelg soils and are much better drained than the Worsham soils.

Profile of Glenville silt loam, 3 to 8 percent slopes, in a cultivated field southeast of Littlestown:

Ap—0 to 9 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable when moist; 5 percent schist fragments; pH 6.6 (limed); clear, smooth boundary; 7 to 10 inches thick.

A3—9 to 18 inches, dark-brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure breaking to fine, granular structure; friable when moist; 5 percent schist fragments; pH 6.2; gradual, smooth boundary; 6 to 11 inches thick.

B2t—18 to 23 inches, yellowish-brown (10YR 5/4) silty clay loam; few, fine and medium, faint mottles of brownish yellow (10YR 6/8), and light yellowish brown (10YR 6/4); weak, medium, subangular blocky structure; slightly firm when moist, slightly sticky and plastic when wet; patches of clay on ped faces and lining pores; 10 percent schist fragments; pH 6.0; gradual, smooth boundary; 2 to 7 inches thick.

Bx1—23 to 33 inches, yellowish-brown (10YR 5/4) shaly silty clay loam; common, medium, distinct mottles of reddish brown (5YR 4/3); weak, coarse, prismatic structure breaking to moderate, thin and medium, platy and blocky structure; firm when moist, sticky and plastic when wet; thin patches of clay on ped faces and lining pores; 15 percent schist fragments; pH 5.8; gradual, wavy boundary; 8 to 12 inches thick.

Bx2—33 to 40 inches, brownish-yellow (10YR 6/6) shaly silty clay loam; common, medium, distinct mottles of pale yellow (5Y 8/3); weak, coarse, prismatic structure breaking to moderate, medium, platy and blocky structure; firm when moist, sticky and plastic when wet; 25 percent schist fragments; thin, discontinuous clay films; pH 5.8; gradual, wavy boundary; 5 to 10 inches thick.

C—40 inches +, 85 percent schist fragments; silt loam between the fragments.

The surface layer is dark-brown to dark grayish-brown silt loam. The subsoil ranges from yellowish brown to brownish yellow or pale brown and from silt loam to silty clay loam. Mottling ordinarily begins at a depth of about 18 inches, but it may begin at any depth between 15 and 30 inches. The content of mica and schist fragments varies considerably. In some places the A horizon is much thinner than that described. The B horizon has a weak to moderate fragipan.

Guthrie series

The Guthrie series consists of poorly drained Planosols that developed from material washed from limestone and calcareous schist. Guthrie soils occupy upland flats and depressions throughout the limestone areas of the county.

Guthrie soils are near the deep Lawrence and Conestoga soils, the shallow Hollinger soils, and the moderately well drained Wiltshire soils. The surface layer of Guthrie soils is mottled and grayer than that of Lawrence soils, and internal drainage is slower. Guthrie soils are more poorly drained and grayer throughout than the Hollinger, Conestoga, and Wiltshire soils. They have a grayer surface layer than Dunning soils, which are closer to streams and are likely to be flooded.

Profile of Guthrie silt loam in a cultivated field south of Orrtanna:

Ap—0 to 10 inches, dark-gray (10YR 4/1) silt loam; common, medium, distinct mottles of dark brown (7.5YR 3/2); moderate, fine, blocky structure; hard when dry, firm when moist, sticky and plastic when wet; 10 percent quartz gravel; pH 6.8 (limed); clear, smooth boundary; 8 to 12 inches thick.

B2g—10 to 16 inches, olive-gray (5Y 5/2) silty clay; common, medium, distinct mottles of pale olive (5Y 6/3) and yellowish brown (10YR 5/6); weak, coarse, prismatic structure breaking to moderate, medium, blocky structure; hard when dry, firm when moist, very sticky and very plastic when wet; 10 percent quartz gravel; cracks and pores lined with clay deposits; pH 7.0; gradual, wavy boundary; 4 to 8 inches thick.

Bx1g—16 to 30 inches, gray (10YR 5/1) silty clay loam; many, medium, distinct mottles of light olive brown (2.5Y 5/6); weak, coarse, prismatic structure breaking to moderate, medium, platy structure; hard when dry, firm when moist, very sticky and very plastic when wet; 10 percent gravel; cracks and pores lined with clay deposits; pH 7.0; gradual, wavy boundary; 7 to 12 inches thick.

Bx2—30 to 45 inches, brown (7.5YR 5/4) gravelly, gritty clay loam; many, fine, distinct mottles of light olive brown (2.5Y 5/6); weak, very coarse, prismatic structure breaking to weak, medium, platy structure; firm when moist, slightly sticky and slightly plastic when wet; 15 percent fine gravel weathered from limestone conglomerate; pH 7.2.

C—45 inches +, 70 to 90 percent fine gravel weathered from limestone conglomerate.

The surface layer ranges from silt loam to silty clay loam and from very dark gray to dark olive gray. The subsoil is mottled light gray or olive gray and ranges from clay to silty clay loam. Mottling ordinarily begins within 6 inches of the surface, but it may begin at any depth between the surface and about 8 inches. The Guthrie soils range from slightly acid to mildly alkaline. A fragipan may not occur in the finer textured B horizons, and where it does occur it is weakly or moderately developed.

Highfield series

Soils of the Highfield series are deep and moderately deep, well-drained Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Highfield soils formed in material weathered from aporhyolite, rhyolite, metabasalt, sericitic schist, and other light-colored rocks. In some places veins of quartz occur. These soils occur on the rolling to steep uplands of the northern part of the Blue Ridge Mountains in the western and northwestern parts of the county. They also occur on South Mountain, and in Pigeon Hills in the eastern part of the county. These soils developed under a forest of mixed hardwoods, chiefly chestnut oak, chestnut, and hickory. Some hemlock and a ground cover of ferns also occurred.

Highfield soils occur with the shallow Catoctin soils, the deep and moderately deep Myersville soils, the moderately well drained Buchanan soils, and the somewhat poorly drained to very poorly drained Rohrersville soils. Highfield soils lack the reddish hue of the Myersville soils and have coarser texture and a weaker B horizon.

Profile of Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded, in an apple orchard in Menallen Township, 0.5 mile northeast of Wenksville (Laboratory No. S61 Pa-1-11-(1-6) in tables 4 and 10):

Ap—0 to 10 inches, dark grayish-brown (2.5Y 4/2) channery silt loam; weak, medium, granular structure; friable when moist, nonsticky and slightly plastic when wet; 15 to 20 percent coarse fragments; pH 6.0 (limed); clear, smooth boundary; 8 to 11 inches thick.

B21t—10 to 17 inches, brown (10YR 5/3) channery silt loam; weak, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 15 to 20 percent coarse fragments; thin patches of clay film; pH 6.6; clear, wavy boundary; 5 to 9 inches thick.

B22t—17 to 25 inches, yellowish-brown (10YR 5/6) channery silt loam; weak, fine, subangular blocky structure; friable when moist, sticky and slightly plastic when wet; 20 to 25 percent coarse fragments; thin patches of clay film; pH 6.6; clear, wavy boundary; 6 to 10 inches thick.

B23t—25 to 30 inches, yellowish-brown (10YR 5/6) channery silt loam; weak, fine, subangular blocky structure; friable when moist, sticky and plastic when wet; 20 to 25 percent coarse fragments; thin patches of clay film; pH 6.6; clear, wavy boundary; 3 to 7 inches thick.

B3—30 to 39 inches, light olive-brown (2.5Y 5/4) channery silt loam; weak, fine, subangular blocky structure; friable when most, slightly sticky and slightly plastic when wet; 50 percent coarse fragments; thin patches of clay film; pH 6.5; gradual, wavy boundary; 6 to 12 inches thick.

C—39 to 45 inches, reddish-gray (10YR 6/1) metarhyolite and light olive-brown (2.5Y 5/4) silt loam; 95 percent coarse fragments; pH 6.2.

Profile of Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded, in an apple orchard in Hamiltonban Township, 3½ miles southwest of Fairfield (Laboratory No. S61Pa-1-12-(1-7) in tables 4 and 10):

Ap—0 to 9 inches, dark yellowish-brown (10YR 4/4) channery silt loam; weak, fine and medium, granular structure; friable when moist, nonsticky and slightly plastic when wet; 25 percent coarse fragments; pH 6.4; clear, smooth boundary; 8 to 10 inches thick.

A3—9 to 12 inches, dark yellowish-brown (10YR 4/4) channery silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 20 to 25 percent coarse fragments; pH 6.4; clear, wavy boundary; 2 to 4 inches thick.

B21t—12 to 18 inches, light olive-brown (2.5Y 5/4) channery silt loam; moderate, fine, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 25 to 30 percent coarse fragments; thin, discontinuous clay films; pH 6.4; clear, wavy boundary; 4 to 8 inches thick.

B22t—18 to 24 inches, light olive-brown (2.5Y 5/4) channery silt loam; moderate, medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; 20 to 25 percent coarse fragments; thin, discontinuous clay films; pH 6.2; clear, wavy boundary 4 to 8 inches thick.

B23—24 to 32 inches, light olive-brown (2.5Y 5/4) channery silt loam; weak, fine, subangular blocky structure; friable when moist; slightly sticky and plastic when wet; 25 to 30 percent coarse fragments; thin, discontinuous clay films; pH 5.8; gradual, wavy boundary; 6 to 11 inches thick.

B3—32 to 38 inches, olive (5Y 5/4) very channery loam; some streaks of dark brown (7.5YR 4/4); weak, fine, subangular blocky structure; friable when moist, slightly

sticky and slightly plastic when wet; 60 percent coarse fragments; thin patches of clay films; pH 5.9; gradual, wavy boundary; 3 to 9 inches thick.

C—38 to 42 inches, light olive-brown (2.5Y 5/6) loam, saprolite, or soft rock; streaks of yellow (10YR 7/8) and olive brown (2.5Y 4/4); firm when moist; pH 6.2; mostly weathered greenstone and aporhyolite.

R—42 to 50 inches +, pale-green (5G 6/2), gray (5G 4/1), and pinkish-white (5YR 8/2), hard greenstone and aporhyolite.

In cultivated areas the surface layer generally ranges from dark grayish brown to dark yellowish brown and from silt loam to channery loam or stony loam. The subsoil ranges from silt loam to silty clay loam and is generally channery but in some areas is stony. It ranges from olive to yellowish brown or from brown to pinkish white and has a purple or reddish-gray cast in some places. The reddish-gray color is inherited from the parent material. Depth to bedrock ranges from 3 to 6 feet or more. Some areas are very stony loam and have been mapped separately in this county.

Hollinger series

The Hollinger series consists of shallow and moderately deep, well-drained Gray-Brown Podzolic soils that developed from calcareous schist or micaceous Conestoga limestone. In Adams County, Hollinger soils extend from Littlestown to areas north and west of McSherrystown. These soils have a yellowish-brown to strong-brown or brownish-yellow silt loam or heavy silt loam subsoil in which the textural B horizon is weakly expressed.

Hollinger soils occur with the deep Conestoga soils, the moderately well drained Wiltshire soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils.

Profile of Hollinger silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field west of McSherrystown:

Ap—0 to 7 inches, yellowish-brown (10YR 5/6) silt loam; weak, fine, granular structure; very friable when moist; few large stones and small boulders; pH 7.2 (limed); clear, smooth boundary; 6 to 9 inches thick.

B2t—7 to 13 inches, strong-brown (7.5YR 5/6) channery silt loam; weak, medium, subangular blocky structure breaking to fine granular structure; friable when moist, slightly sticky and slightly plastic when wet; thin patches of clay film; 20 to 35 percent coarse fragments; pH 7.2; gradual, wavy boundary; 4 to 8 inches thick.

B3—13 to 16 inches, brownish-yellow (10YR 6/6) channery silt loam; weak, thin, platy structure breaking to weak, fine, granular structure; friable when moist; slightly sticky when wet; thin, discontinuous clay films; 35 to 55 percent coarse fragments; pH 7.2; gradual, irregular boundary; 2 to 8 inches thick.

C—16 to 24 inches, soft, weathered limestone; friable when moist; 95 percent coarse fragments; pH 7.2; diffuse, wavy boundary; 4 to 12 inches thick.

R—24 inches +, broken, partly weathered bedrock.

The A horizon ranges from 1 to 9 inches in thickness, but it may be absent in severely eroded areas. The surface layer ranges from yellowish brown to yellowish red, and from silt loam to silty clay loam. It is shaly in many places. Depth to the calcareous material ranges from 12 to 30 inches. The B horizon is silty and is thinner than that of most other shallow soils in the county. The subsoil ranges from brownish yellow to yellowish red. Coarse fragments make up, by volume, 15 to 60 percent or more of the B horizon.

Klinesville series

The Klinesville series consists of shallow and very shallow soils that formed on weak-red or dark-red shale and sandstone. Fragments of shale and sandstone are on the surface and throughout the profile in large amounts. These soils are Lithosols that intergrade toward Sols Bruns Acides. Klinesville soils are extensive in Adams County. They occur throughout the central part and extend from the Maryland State line northeastward to the York County line. Slopes are nearly level to steep. The B horizon, where present, is thin or very thin and weakly developed. As in Sols Bruns Acides, the B horizon has little or no accumulation of illuvial clay, and its structure is moderate or weak. The native vegetation consisted of mixed hardwoods, mostly oak and hickory.

Klinesville soils are near the moderately deep, well drained Penn soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. They are also near the Reaville soils and have about the same depth to hard rock, but Klinesville soils are better drained than Reaville soils. Klinesville soils are redder and less sandy than Steinsburg soils.

Profile of Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field northwest of Hunterstown.

Ap—0 to 8 inches, reddish-brown (5YR 4/4) shaly silt loam; weak, fine, granular structure; very friable when moist; 30 percent shale fragments; many roots; pH 5.4; clear, smooth boundary; 6 to 9 inches thick.

B2—8 to 14 inches, red (2.5YR 4/6) very shaly silt loam; weak, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 60 percent coarse fragments; pH 5.4; clear, wavy boundary; 3 to 10 inches thick.

C—14 to 16 inches, dark-red (2.5YR 3/6), shattered shale with silt loam deposits on and between shale fragments; 90 percent fragmented shale; pH 5.6; clear, wavy boundary; 1 to 4 inches thick.

R—16 inches +, weak-red (10YR 4/4), fractured shale with a little silt in the cracks.

The surface layer is generally shaly silt loam, but in a few places it is silt loam or very shaly silt loam. The subsoil is shaly silt loam or very shaly silt loam. The amount of coarse fragments increases with depth; the surface layer generally is nonskeletal and the subsoil is skeletal. Hue is generally 2.5YR but ranges from 5YR to 10R. The B horizon is thin or very thin and weakly developed, and there is little or no evidence of accumulated clay. In unlimed areas the Klinesville soils are very strongly acid or strongly acid. They range from about 10 to 18 inches in thickness. Depth to hard shale ranges from 6 to 36 inches.

Lamington series

The Lamington series consists of deep, poorly drained and somewhat poorly drained Low-Humic Gley soils that developed in material weathered from red shale, sandstone, and conglomerate. Most of the parent material was washed from areas of Penn and Readington soils. Lamington soils occur on nearly level to level terraces along the larger streams of the county.

Lamington soils are near the well drained Birdsboro soils and the moderately well drained Readington soils.

In many places Lamington soils lie next to the Bowmansville and Rowland soils on the flood plains.

Profile of Lamington silt loam in an abandoned pasture north of Arendtsville:

A1—0 to 1 inch, dark-brown (7.5YR 4/2) silt loam; weak, very fine, subangular blocky structure; very friable when moist; few faint specks or very faint mottles; pH 5.8 (limed); abrupt, smooth boundary; 0 to 2 inches thick.

A2g—1 to 6 inches, dark reddish-gray (5YR 4/2) silt loam; common, fine, distinct mottles of red (2.5YR 4/6); weak, medium, platy structure breaking to weak, very fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 10 percent cobblestones; pH 5.8; clear, wavy boundary; 4 to 7 inches thick.

A3g—6 to 11 inches, light-gray (5YR 6/1) silt loam; common, fine, prominent mottles of red (10R 4/6); fine subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; partial clay films; 10 percent cobblestones; pH 5.8; clear, smooth boundary; 4 to 7 inches thick.

B2g—11 to 16 inches, pinkish-gray (5Y 7/2) silty clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/8); moderate, medium, subangular blocky structure; firm when moist, sticky and plastic when wet; common clay films; 10 percent cobblestones; pH 5.8; clear, wavy boundary; 2 to 6 inches thick.

Bx1g—16 to 24 inches, light-gray (N 7/0) cobbly clay loam; common; medium, distinct mottles of strong brown 7.5YR 5/6); weak, coarse, prismatic structure breaking to moderate, medium, platy structure that breaks to very fine subangular blocky structure; firm when moist; sticky and plastic when wet; common clay films; 15 percent cobblestones; pH 5.4; gradual, wavy boundary; 6 to 10 inches thick.

Bx2g—24 to 31 inches, light-gray (5YR 6/1) cobbly clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/8); black (N 2/0) concretions 1 to 3 millimeters across; weak, very coarse, prismatic structure breaking to coarse subangular blocky structure; firm when moist, sticky and plastic when wet; common clay films; 15 percent cobblestones; pH 5.4; gradual, wavy boundary; 5 to 9 inches thick.

B3g—31 to 36 inches, light-gray (5YR 6/1) cobbly clay loam; many, coarse, distinct mottles of strong brown (7.5YR 5/8); black (N 2/0) concretions 1 to 3 millimeters across; weak, very coarse, prismatic structure breaking to coarse subangular blocky structure; friable when moist, sticky and plastic when wet; 30 percent cobblestones; patches of clay film on peds; pH 5.6; gradual, wavy boundary; 4 to 9 inches thick.

Cg—36 to 60 inches +, gray (N 5/0) cobbly clay loam stratified with lenses and layers of sand and gravel; many, coarse, distinct mottles of reddish yellow (7.5YR 6/8); black (N 2/0) concretions 1 to 5 millimeters across; massive; friable when moist, sticky and plastic when wet; 40 percent cobblestones and some gravel; pH 5.6.

The surface layer ranges from dark brown to dark grayish brown. The subsoil is mottled with colors that range from gray to yellow or reddish brown. It is silty clay to clay loam. The content of sandstone and quartz gravel ranges from 5 to 10 percent in the surface layer and from 15 to 25 percent or more in the lower subsoil. Varying amounts of cobblestones and coarse rock fragments occur on the surface and throughout the profile and range from a few in the surface layer to 60 or 70 percent in the lower subsoil. The Lamington soils are strongly acid where the parent material was derived solely from acid, red sandstone and shale but are slightly acid where the parent material was neutral or alkaline. Mottling generally begins at a depth of about 10 inches but may begin at any depth between the surface and a depth of 15 inches. The solum ranges from 30 to 60 inches in thickness.

Lansdale series

Soils of the Lansdale series are well drained and moderately deep or deep over yellow, brown, gray, and pink shale and soft, yellow arkosic sandstone and conglomerate. These soils are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. The largest areas of Lansdale soils extend from Abbottstown to New Oxford and Germantown in a belt several miles wide. These soils are mostly moderately sloping, but there are a few narrow, steep ridges and some broad, gently sloping areas. The native vegetation consisted mostly of mixed hardwoods, chiefly oak and hickory.

Lansdale soils are near the sandy Steinsburg soils, the well drained Penn soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. Lansdale soils are less red and generally have coarser texture than the Penn soils.

Profile of Lansdale loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field southwest of Littlestown:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loam; weak, fine, granular structure; loose when dry, very friable when moist; 5 percent gravel; pH 5.8 (limed); clear, smooth boundary; 6 to 10 inches thick.

B1—9 to 14 inches, dark-brown (10YR 4/3) loam; weak, medium, granular structure; very friable when moist; 10 percent soft sandstone fragments; pH 5.6; clear, smooth boundary; 3 to 7 inches thick.

B2t—14 to 24 inches, brown (10YR 5/3) gravelly loam; weak, medium, subangular blocky structure; friable when moist, nonsticky and slightly plastic when wet; 35 percent sandstone fragments; thin clay films on ped faces and lining pores; pH 5.4; gradual, wavy boundary; 7 to 12 inches thick.

B3—24 to 32 inches, brown (10YR 5/3) very gravelly sandy loam; weak, fine, granular structure; friable when moist; 65 to 85 percent sandstone fragments; pH 5.4; gradual, wavy boundary; 6 to 11 inches thick.

C—32 inches +, brown (10YR 5/3) and light yellowish-brown (10YR 6/4) weathered sandstone; a few black specks.

Loam is the only type mapped, but small areas of silt loam and sandy loam occur. The surface layer is generally dark brown or very dark grayish brown. Hue of the surface layer and subsoil is generally 10YR. The subsoil is yellowish brown to brown. It ranges from loam to sandy loam and, in some areas, is gravelly to very gravelly, particularly in the lower subsoil in areas where the parent material is quartzose conglomerate. Hard fragments of sandstone make up 5 to 15 percent of the surface layers and 85 percent of the lower subsoil. In areas where the Lansdale soils merge with the Penn soils, the Lansdale soils contain less sand and are redder than the soil described. The Lansdale soils are normally strongly acid, but in areas near the Conestoga soils they are influenced by limestone and may be medium acid or only slightly acid. In areas where they were derived from metamorphosed material, Lansdale soils are less acid and have darker color throughout than in the profile described. Depth to the C horizon is 20 to 40 inches, and depth to hard sandstone or conglomerate ranges from 25 to 60 inches.

Lawrence series

The Lawrence series consists of somewhat poorly drained Planosols that developed in material weathered from impure limestone and dolomite. Some of the parent material is residual and some is colluvial-alluvial. Law-

rence soils are in depressions and drainageways in the limestone areas between Littlestown and McSherrystown and in the Fairfield Valley. The native vegetation consisted of stands of oak and hickory that were interspersed with grassy areas.

Lawrence soils are near the shallow, well drained Hollinger soils, the deep, well drained Conestoga soils, the moderately well drained Wiltshire soils, and the poorly drained Guthrie soils. They are less well drained than the Conestoga, Hollinger, and Wiltshire soils and are better drained than the Guthrie soils. The surface layer of Lawrence soils is less gray than that of the Guthrie soils, which is mottled. Also, Lawrence soils generally are more silty than the Guthrie soils.

Profile of Lawrence silt loam in a cultivated field near Edgegrove:

Ap—0 to 11 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, subangular blocky structure breaking to weak, fine, granular structure; friable when moist; pH 6.6; abrupt, smooth boundary; 10 to 12 inches thick.

B21—11 to 16 inches, yellowish-brown (10YR 5/6) silty clay loam; common, medium, faint mottles of yellow (10YR 7/6); moderate, medium, blocky structure; friable when moist, sticky and slightly plastic when wet; thick patches of clay films; many black specks; pH 6.6; clear, smooth boundary; 4 to 7 inches thick.

B22t—16 to 34 inches, yellowish-red (5YR 5/6) silty clay; common, medium, distinct mottles of dark reddish brown (5YR 3/4) and yellowish brown (10YR 5/8); moderate, medium, blocky structure; very sticky and plastic when wet; thin, continuous clay films; pH 6.6; gradual, wavy boundary; 16 to 21 inches thick.

Bx—34 to 42 inches, yellowish-brown (10YR 5/8) silty clay loam; common, coarse, distinct mottles of dark reddish brown (5YR 3/4); moderate, very coarse, prismatic structure breaking to moderate, medium, platy structure and fine blocky structure; firm when moist, sticky and slightly plastic when wet; thin, continuous clay films; pH 6.8; gradual, wavy boundary; 5 to 10 inches thick.

B3—42 to 62 inches, yellowish-brown (10YR 5/8) silty clay loam; common, coarse, distinct mottles of dark reddish brown (5YR 3/4); weak, medium, blocky structure; friable when moist, sticky when wet; many black specks; thick clay films; pH 6.8; diffuse, wavy boundary; 16 to 22 inches thick.

C—62 to 70 inches, brownish-yellow (10YR 6/8) loam, and grayish-brown (2.5Y 5/2), mixed with red, gray, and brown, calcareous, soft, weathered schist or saprolite; some black specks; friable; pH 6.8; gradual, wavy boundary; 6 to 11 inches thick.

R—70 inches +, hard limestone.

The surface layer ranges from dark grayish brown to dark gray. The subsoil ranges from light brownish yellow to light gray and is silty clay loam or clay loam. Depth to mottling ranges from 10 to 15 inches. Dark-colored concretions of iron and manganese occur in the lower subsoil, and in some places chert fragments occur throughout the profile. Some areas are slightly eroded, but most areas are constantly receiving material from the higher slopes. The solum ranges from 40 to 70 inches or more in thickness.

Legore series

The Legore series consists of deep and moderately deep, well-drained Gray-Brown Podzolic soils that developed in material weathered from diabase. These soils have a shallow or moderately deep solum. In most places the underlying diabase has disintegrated into granular, deeply weathered saprolite. In some places large amounts of fragments are on the surface and throughout the profile. Legore soils are moderately extensive in this county. They are in the central part in steep areas where narrow dikes of diabase have intruded up through the red shale. They are also in fairly large areas that are undulating to moderately rolling. The native vegetation consisted of a forest of oak that contained patches of pines and other trees.

Legore soils are near the deep, well drained Montalto soils, the moderately well drained and somewhat poorly drained Mount Lucas soils, and the poorly drained Watchung soils.

Profile of Legore channery silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field between York Springs and East Berlin (Laboratory No. S61Pa-1–19 in table 4):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) channery silt loam; moderate, medium, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 15 percent diabase fragments; pH 6.2; clear, smooth boundary; 6 to 9 inches thick.

B2t—8 to 13 inches, dark-brown (7.5YR 4/4), gritty silty clay loam; strong, medium, blocky structure; firm when moist, sticky and plastic when wet; many small pores, clay patches on peds and lining pores; 10 percent diabase fragments; pH 6.4; gradual, wavy boundary; 3 to 7 inches thick.

B3—13 to 22 inches, dark-brown (7.5YR 4/4) silt loam; specks of very dark grayish brown (10YR 3/2) and strong brown (7.5YR 5/6); moderate, fine and medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; diabase fragments, some bridged by clay, make up 10 percent of horizon; pH 6.4; diffuse, wavy boundary; 6 to 13 inches thick.

C1—22 to 42 inches, yellowish-brown (10YR 5/4), gritty saprolite; specks of dark brown (10YR 4/3); massive; very friable when moist; pH 6.4; diffuse, irregular boundary; 10 to 25 inches thick.

C2—42 to 62 inches +, weak-red (2.5YR 4/2) granular saprolite; specks of dark brown (10YR 4/3); massive; very loose when moist.

The surface layer is generally silt loam or channery silt loam, but in severly eroded areas it ranges to silty clay loam. It ranges from dark brown to dark reddish brown or dark brownish gray but is generally dark grayish brown (10YR 4/2). The B horizon is generally dark brown (7.5YR 4/4). It is silt loam to gritty silty clay loam in most places, but in some places it is sandy loam. The subsoil ranges from 5 to 20 inches in thickness. Depth to hard bedrock varies greatly within short distances. The colors in the C horizon are probably inherited from the parent rock. Stones and large boulders are common on the surface in some areas, and stones and rock fragments occur throughout the profile. Most areas are channery or very channery throughout the profile.

Lehigh series

The Lehigh series consists of moderately well drained and somewhat poorly drained, shallow and moderately deep Gray-Brown Podzolic soils that intergrade toward Planosols. Lehigh soils developed over metamorphosed rocks. The parent material weathered mostly from shale and limestone that have been baked to a bluish gray or purplish slaty color by the heat from diabase intrusions. These soils are on gently sloping to moderately sloping uplands in areas adjacent to the diabase ridges throughout the central part of the county. They are also in narrow bands throughout the shale and sandstone areas of the

county. These soils have a slowly permeable subsoil that impedes drainage and the development of roots. The boundary between the silt loam surface layer and the silty clay or silty clay loam subsoil is distinct. The native vegetation consisted of mixed stands of oak, hickory, and chestnut.

Lehigh soils are near the moderately deep, well-drained Brecknock soils and the poorly drained Croton soils. In places they occur near the channery Legore soils and the deeper, well-drained Montalto soils, which were derived from diabase. Lehigh soils are also near the Penn, Readington, Reaville, and Lansdale soils. Those soils formed over shale and sandstone that have not been metamorphosed.

Profile of Lehigh silt loam, 3 to 8 percent slopes, moderately eroded, in a pasture east of Gettysburg:

Ap—0 to 8 inches, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable when moist; pH 5.6; abrupt, wavy boundary; 7 to 9 inches thick.

B1—8 to 14 inches, dark-gray (10YR 4/1) silt loam; few, medium, faint mottles of gray (10YR 5/1); moderate, medium, prismatic structure breaking to moderate, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; partial clay films on peds; pH 6.2; abrupt, wavy boundary; 3 to 8 inches thick.

B21g—14 to 21 inches, dark-gray (10YR 4/1) silty clay loam; common, medium, faint mottles of gray (N 6/0); strong, medium, prismatic structure; firm when moist, sticky and plastic when wet; prominent clay films on peds; pH 5.2; clear, wavy boundary; 5 to 8 inches thick.

B22g—21 to 30 inches, dark-gray (N 4/0) shaly silty clay loam; common, fine, distinct mottles of olive brown (2.5Y 4/4); strong, medium, prismatic structure; firm when moist, sticky and plastic when wet; prominent clay films on peds; 30 percent rock fragments; pH 5.6; gradual, wavy boundary; 6 to 12 inches thick.

B3g—30 to 40 inches, dark-gray (N 4/0) very shaly silt loam; common, fine, distinct mottles of olive brown (2.5Y 4/4); moderate, fine to medium, subangular blocky structure; firm when moist, slighty sticky and slightly plastic when wet; partial clay films; 65 percent rock fragments; pH 5.6; gradual, wavy boundary; 8 to 13 inches thick.

C—40 to 47 inches +, black (N 2/1), weathered porcelanite.

The surface layer generally is silt loam, but in some places it is channery silt loam or loam. Some areas are very stony, and in places a few boulders are on the surface. The surface layer ranges from dark gray to dark grayish brown and has a hue of 2.5Y to 7.5YR. The gleyed subsoil is mottled olive or gray to yellowish brown or very dark gray and has a hue ranging from 2.5Y to 10YR. The subsoil ranges from silt loam to silty clay loam in texture and from 6 to 28 inches in thickness. It is generally silt loam in areas where these soils are thinnest and have developed from weathered sandstone. The substratum ranges from light gray to black, yellowish red, or brown. Depth to mottling is ordinarily 12 to 20 inches but ranges from 8 to 30 inches, except in the severely eroded, shallow areas where it may begin almost at the surface. The Lehigh soils are strongly acid in some areas and are slightly acid in areas that have been limed.

Lindside series

The Lindside series consists of moderately well drained and somewhat poorly drained Alluvial soils on flood plains. These soils formed in sediments washed from areas of Conestoga or Athol soils. These sediments weathered from limestone or calcareous material. Lindside soils are on level and nearly level first bottoms in the Fairfield Valley and in areas of limestone northeast of Littlestown and around McSherrystown, Edgegrove, and Brushtown. These soils are occasionally flooded in winter and spring. The native vegetation consisted of oak, sycamore, elm, ash, hickory, yellow-poplar, and walnut.

Lindside soils are near the poorly drained Melvin soils and the very poorly drained, dark-colored Dunning soils. They are coarser, somewhat lighter colored, and better drained than the Melvin soils and are less sticky and plastic in the subsoil.

Profile of Lindside silt loam in a pasture southwest of McSherrystown:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; few pebbles; pH 7.2; clear, smooth boundary; 7 to 10 inches thick.

A3—8 to 12 inches, dark-brown (10YR 4/3) silty clay loam; weak, fine, subangular blocky structure breaking to fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; few black specks; pH 6.6; clear, smooth boundary; 3 to 6 inches thick.

C1—12 to 18 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak to moderate, medium to coarse, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; thin, continuous clay films; black specks; pH 6.5; gradual, wavy boundary; 4 to 8 inches thick.

C2g—18 to 46 inches, light brownish-gray (10YR 6/2) clay loam; common, medium, faint mottles of yellowish brown (10YR 5/4), and few distinct mottles of gray (N 6/1); strong, coarse, blocky structure; hard when dry, firm when moist, sticky and plastic when wet; thick, continuous clay films; soft, black specks; pH 6.8; gradual, wavy boundary; 25 to 31 inches thick.

C3g—46 inches +, light brownish-gray (10YR 6/2) and reddish-yellow (7.5YR 6/8) gravelly silty clay loam; common medium, faint and distinct mottles of yellowish brown (10YR 5/4) and gray (N 6/1); medium to thick, platy structure breaking to moderate, medium, blocky structure; hard when dry, firm when moist, sticky and very plastic when wet; thick, continuous clay films; black specks; 35 to 70 percent gravel; pH 6.4.

The surface layer ranges from dark grayish brown to brown, and the upper subsoil is brown or grayish brown to yellowish brown. Depth to mottling ranges from 18 to 36 inches. The subsoil ranges from silt loam to clay. In some areas more gravel occurs on the surface and throughout the profile than in the soil described. Many areas have a thin covering of recently deposited alluvium.

Manor series

Soils of the Manor series are Sols Bruns Acides that have a thin solum and are well drained. These soils developed from weathered schist and phyllite. They are not extensive in this county and occur on the steeper slopes in the extreme southeastern part. Manor soils have weakly developed A and B horizons. The surface horizon is strongly leached. The B horizon has a higher chroma than the A horizon, but it does not contain much more clay than the A horizon, and its structure is only weakly or moderately developed. These soils are medium acid and moderate to low in base saturation. The native vegetation consisted of oak, hickory, chestnut, and yellow-poplar.

Manor soils are near the moderately deep solum Glenelg soils, the moderately well drained Glenville soils, and the poorly drained Worsham soils. Manor soils have a thinner solum, are less well developed, and generally are coarser than these soils.

Profile of Manor loam in a cultivated field south of Littlestown:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) loam; weak, fine, granular structure; friable when moist; 10 percent schist fragments; many pores; pH 6.6 (limed); clear, wavy boundary; 6 to 9 inches thick.

B1—7 to 10 inches, light yellowish-brown (2.5Y 6/4) channery loam; weak, medium, subangular block structure; friable when moist, slightly sticky and slightly plastic when wet; 25 percent schist fragments; pH 6.0; clear, wavy boundary; 2 to 5 inches thick.

B2—10 to 18 inches, olive-yellow (2.5Y 6/6) channery or very channery loam; very weak, medium, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few, thin, discontinuous silt or clay films on coarse fragments; 30 to 55 percent schist fragments; pH 5.6; gradual, irregular boundary; 8 to 14 inches thick.

C—18 inches +, olive-yellow (2.5Y 6/6) and light-gray weathered schist; few white quartz stones and pebbles; pH 5.6; some silt loam coatings.

The surface layer is very dark grayish brown to yellowish brown, and the subsoil is olive yellow to yellowish brown or brownish yellow. The surface layer is generally loam, but in some places it is channery silt loam or very channery silt loam. The subsoil is silt loam, loam, or channery loam. The content of mica ordinarily is high enough to give the soil a greasy feel, but it is low in areas where the parent material is mostly phyllite. In some areas these soils contain fragments of mica schist. Varying amounts of white gravel occur on the surface and throughout the profile. In some places channery fragments make up 50 percent or more of the surface soil.

Melvin series

This series consists of poorly drained and somewhat poorly drained Low-Humic Gley soils on flood plains. These soils developed from recent alluvium that washed from areas of limestone and calcareous shale and schist. They occur near small streams in the Fairfield Valley and, in the eastern part of the county, along Conewago Creek and smaller streams in areas dominated by Conestoga soils. The surface layer is normally moderately thin and high in organic-matter content. The native vegetation was elm, ash, hickory, willow, poplar, and other water-tolerant hardwoods.

Melvin soils are the poorly drained or somewhat poorly drained members of the drainage sequence that includes the moderately well drained Lindside soils and the very poorly drained Dunning soils.

Profile of Melvin silt loam in a pasture southeast of Irishtown:

Apg—0 to 8 inches, dark grayish-brown (2.5Y 4/2) silt loam; few, fine, faint mottles of light olive brown (2.5Y 5/4) and very dark grayish brown (2.5Y 3/2); weak, very fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; pH 7.0; abrupt, smooth boundary; 7 to 9 inches thick.

C1g—8 to 19 inches, dark grayish-brown (2.5Y 4/2) silty clay loam; common, medium, distinct mottles of brown (10YR 5/3) and very dark grayish brown (10YR 3/2); moderate, medium, prismatic structure; firm when moist, slightly sticky and plastic when wet; thick patches of clay film on peds; pH 6.8; gradual, wavy boundary; 7 to 12 inches thick.

C2g—19 to 41 inches, dark grayish-brown (2.5Y 4/2) silty clay loam; many, medium, prominent mottles of brown (7.5YR 4/4); common black concretions; weak, coarse, prismatic structure; firm when moist, slightly sticky and plastic when wet; pores lined with thick deposits of clay; pH 6.8; gradual, wavy boundary; 18 to 30 inches thick.

R—41 inches +, hard dolomite.

The surface layer is generally silt loam, but in some places it is silty clay loam in the lower few inches. It ranges from grayish brown to very dark grayish brown in color and from 5 to 9 inches in thickness. In some places a few, fine, faint mottles occur in the lower part of the surface layer. In some areas, particularly in the Fairfield Valley, gravel makes up as much as 15 percent of the soil mass. The subsoil ranges from silt loam to clay, and the lower substratum is sandy or gravelly in some areas. The subsoil ranges from dark grayish brown to olive or dark gray mottled distinctly or prominently with brown, yellow, red, or purplish gray. In some places a thin layer of sandy, recently deposited alluvium covers the surface. Depth to underlying rock ranges from 3 to 8 feet.

Montalto series

The Montalto series consists of deep, well-drained Red-Yellow Podzolic soils that intergrade toward Reddish-Brown Lateritic soils. Montalto soils developed in material weathered from diabase. The diabase, locally called ironstone or Gettysburg granite, intruded upward between beds of Triassic sandstone and shale. Smaller intrusions of diabase also pushed up through cracks in other formations. Montalto soils are fairly extensive in this county and occur mostly in the central part on narrow ridges where the dikes penetrated the red shale. Topography is generally moderately rolling. In many areas large boulders of diabase restrict the use of these soils for farming. The native forest was mostly oak, but it contained patches of pine and other trees.

Montalto soils are near the well drained Legore soils, the moderately well drained and somewhat poorly drained Mount Lucas soils, and the poorly drained Watchung soils. Montalto soils are deeper than the Legore soils and are redder than the Mount Lucas and Watchung soils.

Profile of Montalto silt loam, 8 to 15 percent slopes, moderately eroded, in a cultivated field south of Bermudian (Laboratory No. S61Pa–1–22 in table 4):

Ap—0 to 9 inches, brown (7.5YR 5/4) silt loam; weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; 10 percent diabase fragments; pH 6.4; clear, smooth boundary; 7 to 10 inches thick.

B21t—9 to 12 inches, reddish-brown (5YR 5/4) silty clay loam; moderate, medium, blocky structure; friable when moist, slightly sticky and plastic when wet; thick clay patches; pH 6.0; abrupt, wavy boundary; 2 to 4 inches thick.

B22t—12 to 21 inches, reddish-brown (5YR 4/4) clay loam; strong, medium, blocky structure; firm when moist, sticky and plastic when wet; continuous clay films; common black iron and manganese coatings; pH 5.8; gradual, wavy boundary; 6 to 11 inches thick.

B23—21 to 28 inches, yellowish-red (5YR 4/6) silty clay loam; common black iron and manganese coatings; strong, medium, blocky structure; firm when moist, sticky and plastic when wet; thick clay patches; pH 5.8; gradual, wavy boundary; 5 to 10 inches thick.

B3—28 to 36 inches, yellowish-red (5YR 5/6) silty clay loam; specks of dark gray (N 4/1) and reddish yellow (7.5YR 7/6); strong, medium, blocky structure; firm when moist, sticky and plastic when wet; pH 5.8; gradual, wavy boundary; 5 to 10 inches thick.

C—36 to 50 inches, strong-brown (7.5YR 5/6) silt loam; specks of dark brown (7.5YR 3/2) and reddish yellow (7.5YR 7/6); massive; friable when moist, slightly sticky and slightly plastic when wet; pH 6.0.

The surface layer is dark brown to dark reddish brown. The subsoil ranges from reddish brown to yellowish red, but it is generally yellowish red (5YR 4/6) in Adams County. In a small area near the Maryland State line and in a slightly larger area southeast of York Springs, the profile is redder throughout than that of the soil described. The surface layer is generally silt loam, but it is very stony in some places. In many places stones and many large diabase boulders occur on the surface and throughout the profile. Many large boulders, some nearly 30 feet high, stand in the Devils Den area of the Gettysburg National Military Park. The B horizon is silty clay loam to clay loam and is channery in some places. The C horizon is gritty silt loam, gritty sandy clay loam, or gritty clay loam. Depth to bedrock ranges from 4 to 10 feet. Stones and boulders make up 5 to 25 percent of the soil mass in the uppermost part of the profile, and they increase with depth. Soft, black iron concretions occur in some places.

Mount Lucas series

The Mount Lucas series consists of deep, somewhat poorly drained and moderately well drained Red-Yellow Podzolic soils that intergrade toward Reddish-Brown Lateritic soils. Mount Lucas soils developed from material weathered from diabase. They occur in nearly level and gently sloping areas where diabase has protruded through Triassic sandstone and shale. Smaller intrusions of diabase have protruded through other formations.

Mount Lucas soils are near the well drained Legore soils, the moderately deep and deep Montalto soils, and the poorly drained Watchung soils. Mount Lucas soils are much better drained and are less gray than the Watchung soils and lack a mottled upper subsoil.

Profile of Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field in Straban Township, 3 miles northeast of Gettysburg (Laboratory No. S61Pa-1-16-(1-6) in tables 4 and 10):

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable when moist; pH 6.4; clear, smooth boundary; 7 to 10 inches thick.

B1—8 to 11 inches, dark yellowish-brown (10YR 4/4) silt loam; moderate, fine, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; pH 6.5; abrupt, smooth boundary; 2 to 4 inches thick.

B21t—11 to 18 inches, dark-brown (7.5YR 4/4) silty clay loam; few, very fine, black specks; strong, medium, subangular blocky structure, and strong, medium, prismatic structure; firm when moist, slightly sticky and plastic when wet; thin, continuous clay films; pH 6.6; gradual, wavy boundary; 5 to 9 inches thick.

B22t—18 to 24 inches, brown (7.5YR 5/4) silty clay loam; common, medium, faint mottles of strong brown (7.5YR 5/6), and distinct mottles of grayish brown (10YR 5/2); a few black specks; strong, medium, prismatic structure; firm when moist, slightly sticky and plastic when wet; thin, continuous clay films; pH 6.7; gradual, wavy boundary; 3 to 9 inches thick.

B3—24 to 28 inches, yellowish-brown (10YR 5/4) silty clay loam; common, medium, distinct mottles of strong brown (7.5YR 5/6), and few, very fine, faint mottles of grayish brown (10YR 5/2); common, fine, black specks; weak, medium, subangular blocky structure; friable when moist, slightly sticky and plastic when wet; thin, continuous clay films; pH 6.6; gradual, wavy boundary; 2 to 7 inches thick.

C—28 to 39 inches +, brown (10YR 5/3), gritty silty clay loam, saprolite, and considerable residual clay; many, medium, distinct mottles of strong brown (7.5YR 5/6), and faint mottles of grayish brown (10YR 5/2); common, medium, black specks; massive; pH 6.7; saprolite weathered from diabase.

Profile of Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field in Reading Township, 2 miles northwest of Hampton (Laboratory No. S61Pa-1-17-(1-6) in tables 4 and 10):

Ap—0 to 7 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium, and coarse, granular structure; friable when moist, slightly sticky and slightly plastic when wet; pH 6.4; abrupt, smooth boundary; 6 to 8 inches thick.

B21t—7 to 15 inches, strong-brown (7.5YR 5/6) silty clay loam; dark-brown (7.5YR 4/4) coatings on peds; moderate, medium, prismatic structure breaking to moderate, medium, blocky structure; friable when moist, slightly sticky and plastic when wet; thin clay films; pH 6.7; clear, wavy boundary; 7 to 9 inches thick.

B22t—15 to 21 inches, reddish-brown (5YR 4/4) silty clay loam; few medium, distinct mottles of red (2.5YR 4/6) and pale brown (10YR 6/3); dark-brown (7.5YR 4/4) ped coatings; moderate, medium, prismatic, structure breaking to moderate, medium, blocky structure; firm when moist, sticky and plastic when wet; distinct clay films; pH 6.7; clear, wavy boundary; 4 to 9 inches thick.

B23—21 to 26 inches, dark-brown (7.5YR 4/4) mixed strata of loam and silty clay loam; common, medium, distinct mottles of brown (10YR 5/3) and reddish brown (5YR 4/3); ped faces of dark brown (10YR 4/3) and yellowish brown (10YR 5/6); weak prismatic structure and coarse blocky structure; firm when moist, slightly sticky and slightly plastic when wet; partial clay films; few black and gray specks; pH 6.8; clear, wavy boundary; 3 to 8 inches thick.

B3—26 to 33 inches, yellowish-brown (10YR 5/4) light sandy clay loam; few, fine, distinct mottles of yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2); weak, fine and medium, platy structure; friable when moist, sticky and plastic when wet; some clay lens of dark brown (7.5YR 4/4); common, black and white specks; pH 6.8; gradual, wavy boundary; 5 to 9 inches thick.

C—33 to 38 inches, light yellowish-brown (10YR 6/4) sandy loam and saprolite; some grains of light gray (10YR 7/2) and black; platy structure; friable when moist; pH 6.8.

In places stones and boulders are on the surface. The surface layer ranges from dark yellowish brown to dark grayish brown and generally has a hue of 7.5YR to 10YR. It is silt loam or loam and is generally about 8 inches thick but ranges from 2 or 3 inches in thickness in eroded areas to 10 inches in uneroded areas. The subsoil ranges from 12 to 25 inches in thickness. Depth to mottling ranges from 15 to 30 inches but generally is between 16 and 20 inches. The upper subsoil is brownish yellow to yellowish brown and has a hue of 7.5YR to 5YR or 10YR. It ranges from silt loam to gritty silty clay loam. In some places the lower subsoil is sandy loam. In many places it is gritty and contains a large amount of iron-bearing minerals that remain in the soil after the other material has disintegrated.

Myersville series

The Myersville series consists of deep and moderately deep, well-drained Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. These soils formed over metamorphosed volcanic rocks. The rocks were chiefly basalt, but the basalt has been altered to greenstone containing belts of speckled sericitic schist and discontinuous veins of impure quartzite. Myersville soils occur in the western and northwestern parts of the county on moderately steep slopes of the South Mountain area. Native vegetation was a forest of mixed hardwoods, chiefly oak and hickory.

Myersville soils are near the Highfield, Catoctin, and Arendtsville soils. Myersville soils were dervied from greenstone, but the Highfield soils were derived from aporhyolite, rhyolite, metabasalt, and other rocks. Also, Myersville soils are redder and have a less distinct A2 horizon than Highfield soils. Myersville soils are deeper and slightly redder than the Catoctin soils and have a thicker, finer textured, more prominent B horizon. They are not so deep as the gravelly Arendtsville soils and contain less sand and fewer coarse fragments. Myersville soils also occur with the moderately well drained Buchanan soils and the poorly drained Rohrersville soils.

Myersville soils are similar to the Montalto soils in color but have a coarser textured, less sticky, more strongly acid B horizon. They resemble the Athol soils but are not so deep, have less clay in the B horizon, developed from more acid material, and are more acid in the subsoil. In color and degree of horizonation, Myersville soils resemble the Glenelg soils but are slightly deeper, are less acid, and have more clay in the subsoil.

Profile of Myersville silt loam, 8 to 15 percent slopes, moderately eroded, south of Mount Hope in a formerly cultivated area that was recently planted to trees:

Ap—0 to 9 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable when moist; 10 percent greenstone pebbles up to 2 inches across; pH 6.2; clear, smooth boundary; 7 to 10 inches thick.

B1—9 to 14 inches, yellowish-red (5YR 5/6) silty clay loam; weak, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; 10 percent greenstone pebbles up to 2 inches across; thin, discontinuous clay films; few black coatings; many roots; pH 5.2; clear, wavy boundary; 3 to 7 inches thick.

B2t—14 to 27 inches, yellowish-red (5YR 4/6) channery silty clay loam; moderate, medium, blocky structure; firm when moist, slightly sticky and plastic when wet; 15 percent greenstone pebbles and channery fragments; prominent, discontinuous clay films; common black coatings; gradual, wavy boundary; 10 to 15 inches thick.

B3—27 to 38 inches, yellowish-red (5YR 5/6) channery silt loam; patches of strong brown (7.5YR 5/6); weak, fine, blocky structure; friable when moist, slightly sticky and plastic when wet; 15 percent greenstone pebbles and fragments; some clay deposits; common black coatings; pH 5.4; gradual, irregular boundary; 7 to 16 inches thick.

C—38 to 48 inches +, yellowish-brown (10YR 5/4) channery loam; patches of reddish-brown (5YR 4/3) saprolite; hard greenstone pebbles and fragments; massive; about 30 percent fine, gravelly, disintegrated greenstone; common black coatings; pH 5.4.

The surface layer is normally silt loam, but in some places it is channery or stony. The surface layer is generally brown, but in some places it is dark grayish brown, and in cultivated areas it is reddish brown or dark brown. It has a hue of 10YR or 7.5YR. The thickness of the A horizon ranges from 3 inches in some eroded areas to 10 inches in uneroded areas. The subsoil is yellowish red to reddish brown and has a hue of 5YR to 10YR. It is silty clay loam or clay loam. The solum is 2½ to 5 feet thick.

Penn series

The Penn series consists of well-drained, moderately deep and shallow, medium-textured soils that formed on weak-red or reddish-brown sandstone and shale of Triassic age. These soils are gently sloping to moderately sloping. They are Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Penn soils extend from Maryland northeastward through the middle of the county. Gettysburg is near the center of the area that is largely Penn soils. The native vegetation was mixed hardwoods, chiefly oak and hickory.

Penn soils are near the shallow Klinesville soils, the moderately well drained Readington soils, the somewhat poorly drained Abbottstown soils, and the poorly drained Croton soils. They are also near the Lansdale soils and are redder throughout and generally finer textured. Penn soils formed on weathered red shale, whereas Lansdale soils formed on gray or yellow weathered shale, sandstone, or conglomerate.

Profile of Penn silt loam, 3 to 8 percent slopes, moderately eroded, in a cultivated field near Hunterstown (Laboratory No. S61Pa-1-43 in table 4):

Ap—0 to 8 inches, reddish-brown (5YR 5/4) silt loam; weak, fine, granular structure; loose to very friable when moist; 5 percent shale fragments and chips; many pores of varied sizes; roots abundant; pH 5.2; clear, smooth boundary; 6 to 9 inches thick.

B1—8 to 13 inches, reddish-brown (2.5YR 4/4) silt loam; weak, medium, subangular blocky structure breaking to moderate, fine, granular structure; slightly hard when dry, friable when moist, slightly plastic when wet; thin, discontinuous clay films on peds; 10 percent shale fragments; many fine and a few large pores; roots common; pH 5.2; clear, smooth boundary; 3 to 7 inches thick.

B2t—13 to 23 inches, weak-red (10YR 4/4) shaly silty loam; moderate, medium, subangular blocky structure; slightly hard when dry, firm when moist, sticky and slightly plastic when wet; prominent clay films on peds; 20 percent coarse shale fragments and weathered siltstone; many fine and a few large pores; roots few; pH 5.4; clear, smooth boundary; 8 to 12 inches thick.

B3—23 to 27 inches, weak-red (10R 4/4) very shaly silt loam; moderate, medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky when wet; thick patches of clay films; 80 percent shale fragments and weathered siltstone; pH 5.6; gradual, wavy boundary; 2 to 7 inches thick.

C—27 to 34 inches, weathered fragments of shale and siltstone make up 95 percent of horizon; weak-red (10R 4/4) silt coatings on fragments; many black coatings of iron and manganese; thin, discontinuous clay films; strong, thin, platy structure; firm when moist.

R—34 inches +, dark reddish-brown hard shale.

Silt loam is the only type mapped, but some small areas are loam and many areas are shaly. The B horizon has a hue of 2.5YR to 10R, a value of 3 or 4, and a chroma of 4. Its structure ranges from moderate, medium, subangular blocky structure to weak, fine, subangular block structure. The B horizon is dominantly silt loam, but it is silty clay loam or shaly silt loam in some places. Clay films on peds of the B horizon range from thin and discontinuous to thick. Shale fragments make up 5 to 50 percent of the B

horizon. Except in eroded areas, the depth to hard shale ranges from 20 to 36 inches. In some places where Penn soils merge with Lansdale soils, the Penn soils generally have a higher than normal content of sand. The Penn soils are normally strongly acid, but in areas where they are near Conestoga soils they are medium acid or slightly acid.

Readington series

The Readington series consists of moderately well drained, moderately deep and deep Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Readington soils developed in material weathered from Triassic red sandstone and shale of the Gettysburg and Heidlersburg formations and from the gray, brown, and yellow soft shale and arkosic sandstone of the New Oxford formation. They occur in drainageways, in depressions, and in the more nearly level areas underlain by red shale and sandstone. These soils are medium textured to fine textured, and they have a weak to moderate fragipan. The B horizon has had a moderate increase in clay, and its structure is moderate and subangular blocky or blocky. The native vegetation was mostly forest of mixed hardwoods.

Readington soils are near the shallow, yellowish, well-drained Steinsburg soils, the moderately deep, well-drained Penn soils, the poorly drained Croton soils, the well-drained Klinesville soils, the somewhat poorly drained Reaville soils, and the well-drained Lansdale soils. The Readington soils are deeper than the Penn and Klinesville soils and are redder than the Lansdale soils. They have a thicker solum than the Reaville soils and are deeper to hard red shale. They are similar to the Lehigh soils in drainage but are redder throughout and have a thicker solum. Readington soils are redder and less poorly drained than the Abbottstown soils.

Profile of Readington silt loam, 0 to 3 percent slopes, in a cultivated field southwest of Bonneauville:

Ap—0 to 10 inches, dark-brown (7.5YR 3/2) silt loam; weak, fine, granular structure; very friable when moist; pH 6.2; gradual, smooth boundary; 7 to 12 inches thick.

B1—10 to 18 inches, dark reddish-brown (5YR 3/3) silt loam; moderate, thin and medium, platy structure breaking to very fine subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; partial clay films; pH 6.4; clear, wavy boundary; 6 to 10 inches thick.

B21t—18 to 27 inches, dark reddish-brown (5YR 3/3) silty clay loam; a few streaks of yellowish red (5YR 5/6); moderate, fine to medium, subangular blocky structure; firm when moist, sticky and plastic when wet; partial clay films; pH 6.2; gradual, wavy boundary; 6 to 13 inches thick.

Bx—27 to 40 inches, dark reddish-brown (5YR 3/3 silty clay loam; common, fine, distinct mottles of yellowish brown (10YR 5/6); moderate, very coarse, prismatic structure breaking to moderate, thin, platy structure and blocky structure; firm when moist, sticky and plastic when wet; thick, continuous clay films; few black coatings on peds; pH 6.2; gradual, wavy boundary; 9 to 15 inches thick.

C—40 to 46 inches, dark reddish-brown (5YR 3/3) very shaly silty clay loam; fine, distinct mottles of yellowish brown (10YR 5/6); weak, platy structure breaking to subangular, blocky structure; friable when moist, slightly sticky when wet; thick discontinuous clay films; 70 to 85 percent shale and sandstone fragments; clear, wavy boundary; 5 to 8 inches thick.

R—46 inches +, acid, weak-red (2.5YR 4/2) Triassic shale.

The surface layer is generally silt loam but is sandy loam in the area near the Lansdale soils where the underlying material is the New Oxford formation. The surface layer ranges from dark reddish brown (5YR 3/3) to dark grayish brown (10YR 4/2) and is more gray in areas of sandy loam. The subsoil is generally silty loam or silty clay loam, but it is sandy loam in some areas underlain by the New Oxford formation. The subsoil ranges from dark reddish brown (5YR 3/3) to yellowish red (5YR 5/6) or grayish brown (10YR 5/2). Depth to mottling ranges from 15 to 30 inches but is generally between 18 and 20 inches. Hard shale or sandstone is at a depth ranging from 28 to 60 inches and is deepest on the lower slopes where colluvium from higher slopes has been deposited. The Readington soils are normally strongly acid but are slightly acid in areas where limestone or diabase has influenced the soil material.

Reaville series

Reaville series consists of shallow and moderately deep, somewhat poorly drained, medium-textured Gray-Brown Podzolic soils. Reaville soils formed on acid red shale and fine-grained sandstone, mostly of the Heidlersburg formation. They are widely distributed in the more shaly areas of the central part of Adams County. In most places these soils are on rolling to undulating ridgetops or moderate upland slopes. Most of the acreage is in a belt that lies just west of Gettysburg and extends from the Maryland State line northeastward to the York County line.

Reaville soils are near the Penn, Readington, Abbottstown, Croton, and Klinesville soils. They are shallower to hard shale and less well drained than the Penn soils and are shallower to bedrock than the Readington and Abbottstown soils. Reaville soils are shallower, better drained, less gray, and less mottled than the Croton soils. They developed on material similar to the parent material of Klinesville soils but are slightly deeper to shale bedrock and have a mottled B horizon, which is lacking in the Klinesville soils. Reaville soils occur with the Klinesville soils in areas where the underlying red shale is in horizontal strata.

Profile of Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded, in a cultivated field in Huntington Township, 2 miles southeast of York Springs (Laboratory No. S61Pa-1-10-(1-4) in tables 4 and 10):

Ap—0 to 8 inches, dark reddish-brown (2.5YR 3/4) shaly silt loam; moderate, medium, granular structure and weak, thin, platy structure; friable when moist, slightly sticky and slightly plastic when wet; 15 percent coarse fragments; pH 6.2 (limed); clear, smooth boundary; 7 to 11 inches thick.

B2t—8 to 12 inches, reddish-brown (2.5YR 4/4) shaly silt loam; few, fine, faint mottles of reddish brown (2.5YR 5/4); weak to moderate, fine, subangular blocky structure breaking to fine granular structure, friable when moist, slightly sticky and plastic when wet; 40 percent coarse shale fragments; thin patches of clay films; pH 6.2; diffuse, wavy boundary; 4 to 11 inches thick.

B3—12 to 15 inches, pale-red (10YR 6/2) silt loam; few, distinct mottles of yellowish red (5YR 5/8); 80 percent weak-red (10R 4/4) shale fragments; weak, very fine subangular blocky structure; friable when moist slightly sticky and slightly plastic when wet; pH 6.0; clear, wavy boundary; 1 to 5 inches thick.

C 15 to 22 inches, dusky-red (10R 3/4) shale makes up 95 percent of horizon; weak-red (10R 5/2) silt loam coat-

ings; pH 5.6; gradual, wavy boundary; 4 to 10 inches thick.

R—22 inches +, red (10R 4/6), hard siltstone; a few pale-red (10R 6/2) silty clay coatings in cracks.

Profile of Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded, in a cultivated field in Freedom Township, 5 miles southwest of Gettysburg (Laboratory No. S61Pa-1-13-(1-4) in tables 4 and 10):

Ap—0 to 9 inches, reddish-brown (5YR 4/3) shaly silt loam; 20 percent shale fragments 1 inch across; weak, fine, granular structure; a few eroded clay films; friable when moist, slightly plastic when wet; pH 7.0 (limed); clear, smooth boundary; 8 to 10 inches thick.

B2t—9 to 13 inches, reddish-brown (2.5YR 4/4) shaly silt loam; few, fine, faint mottles of light reddish brown (5YR 6/3); 35 percent coarse fragments; weak, very fine, subangular blocky structure; thin, discontinuous clay films on peds; slightly sticky and slightly plastic when wet; pH 6.9 (limed); clear, wavy boundary; 2 to 6 inches thick.

B3—13 to 15 inches, reddish-brown (2.5YR 4/4) shaly silt loam; common, fine, distinct mottles of yellowish red (5YR 5/8) and reddish gray (5YR 5/2); 45 percent coarse fragments; moderate, medium, subangular blocky structure breaking to weak platy structure; thick, discontinuous clay films on peds; firm in place, and friable when removed; slightly sticky and slightly plastic when wet; pH 6.8 (limed); clear, wavy boundary; 1 to 4 inches thick.

C—15 to 25 inches, dusky-red (10R 3/4) siltstone; about 2 percent gray silt loam coatings; a few black films; firm in place; pH 6.8.

R—25 inches +, red, hard siltstone.

The surface layer ranges from dark reddish brown to reddish brown and from shaly silt loam to silt loam. The subsoil is very shaly silt loam, shaly silt loam, or silt loam and in places is weak red to dusky red. The surface layer generally is 5 to 9 inches thick, but in some severely eroded areas all of the original surface soil has been removed. The B horizon ranges from 3 to 12 inches in thickness. Depth to hard bedrock ranges from 6 to 30 inches.

Rohrersville series

The Rohrersville series consists of poorly drained and somewhat poorly drained Low-Humic Gley soils that formed in colluvial-alluvial material. These soils occur in drainageways and depressions in the western and northwestern parts of the county, and they are kept wet for long periods by surface water or a high water table. They developed from material brought in from areas of Highfield, Myersville, and Edgemont soils, or in residuum similar to that material. The surface layer of Rohrersville soils is normally dark colored because organic matter has accumulated. The subsoil is distinctly mottled and is finer textured and lighter colored than the surface layer. A fragipan in the lower part of the solum slows the movement of air and water and the penetration of roots.

The Rohrersville soils are near the shallow Catoctin soils, the deep, well drained Myersville and Highfield soils, and the moderately well drained Buchanan soils.

Profile of Rohrersville silt loam in a wooded area near Mount Hope:

A1—0 to 3 inches, very dark-brown (10YR 2/2) silt loam; weak, fine, granular structure; loose when dry, friable when moist; 10 percent fine gravel; pH 5.0; abrupt, smooth boundary; 2 to 4 inches thick.

A2—3 to 7 inches, light yellowish-brown (10YR 6/4) and very dark grayish-brown (10YR 3/2) silt loam; few, medium, distinct mottles of red (2.5YR 5/8); weak, fine, granular structure; friable when moist, slightly sticky and slightly plastic when wet; pH 5.0; clear, smooth boundary; 3 to 6 inches thick.

B1—7 to 12 inches, light yellowish-brown (10YR 6/4) silty clay loam; few, medium, distinct mottles of red (2.5YR 5/8) and gray (10YR 6/1); weak, medium, subangular blocky structure; slightly firm when moist, sticky and plastic when wet; thin, continuous clay films; pH 5.2; clear, smooth boundary; 4 to 7 inches thick.

B21t—12 to 21 inches, yellow (2.5Y 7/8) silty clay loam; many, common, distinct mottles of reddish yellow (7.5YR 6/8) and few medium mottles of gray (10YR 6/1); moderate, medium, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; thick, continuous clay films; pH 5.2; clear, smooth boundary; 7 to 11 inches thick.

Bx—21 to 48 inches, olive-yellow (2.5Y 6/6) clay loam; many, common, distinct mottles of reddish yellow (7.5YR 6/8) and light gray (N 7/0); moderate, coarse and medium, subangular blocky structure; hard when dry; firm when moist, sticky and plastic when wet; thick, continuous clay films; 10 percent fine gravel; pH 5.4; gradual, wavy boundary; 25 to 30 inches thick.

Bx2—48 to 56 inches, yellow (10YR 7/8) gravelly sandy loam; many, coarse and medium, distinct mottles of reddish yellow (7.5YR 6/8), and few, medium, distinct mottles of dark gray (10YR 4/1) and gray (10YR 5/1); weak, very thick, platy structure breaking to moderate, medium and fine, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; thick, discontinuous clay films; 15 to 30 percent fine and medium gravel; pH 5.4; gradual, wavy boundary; 5 to 12 inches thick.

IIC—56 inches +, black (10YR 2/1) sand and gravel.

The surface layer ranges from silt loam to loam and is gravelly to very stony in some areas. It ranges from very dark brown to light yellowish brown or pale brown. The subsoil ranges from yellow to yellowish brown or yellowish red and has a hue of 2.5YR to 7.5YR. It is silty clay loam, silty clay, or clay and contains varying amounts of sand and gravel. The solum is 36 to 56 inches or more thick. It is strongly acid or medium acid. The thickness of the colluvial or alluvial deposits ranges from 3 to 50 feet. Depth to mottling ranges from 1 inch to 10 inches. The mottles are faint to prominent and are gray, brown, yellow, red, or olive. The very stony areas are mapped separately in this county.

Rowland series

The Rowland series consists of medium-textured, moderately well drained Alluvial soils that developed in sediments washed largely from areas of red shale and sandstone. These soils occur on flood plains throughout the central part of the county. Flooding frequently brings in new material, and the degree of profile development varies from place to place. The native vegetation was a forest of ash, elm, maple, walnut, locust, oak, and hickory.

Rowland soils are the moderately well drained members of the drainage sequence that includes the well drained Bermudian soils and the poorly drained Bowmansville soils.

Profile of Rowland silt loam in a pasture west of Littlestown (Laboratory No. S61Pa-1-37 in table 4):

Ap—0 to 11 inches, reddish-brown (2.5YR 4/4) silt loam; weak, fine and medium, granular structure; friable when moist; pH 6.6 (limed); clear, smooth boundary; 9 to 13 inches thick.

C1—11 to 15 inches, reddish-brown (2.5YR 5/4) silt loam; dark-colored specks; weak, thin, platy structure breaking to fine granular structure; friable when moist; numerous pores; pH 6.6; abrupt, smooth boundary; 3 to 5 inches thick.

C2—15 to 25 inches, light-brown (7.5YR 6/4) silt loam; common, fine and medium, distinct mottles of brownish yellow (10YR 6/6) and pinkish gray (7.5YR 7/2); weak, thin, platy structure; friable when moist, slightly sticky and slightly plastic when wet; numerous pores; pH 5.6; clear, smooth boundary; 8 to 12 inches thick.

C2g—25 to 48 inches, weak-red (2.5YR 5/2) silty clay loam; many, medium, distinct mottles of strong brown (7.5YR 5/6) and pale red (2.5YR 6/2); moderate, coarse, prismatic structure when wet; very thick clay films on prism faces; pH 5.6.

C4g—48 inches +, stratified sand over gravel at a depth of 60 inches.

The surface layer is generally silt loam, but it ranges to loam or sandy loam. Varying amounts of quartz pebbles, 1 to 2 inches across, occur in the surface layer and generally increase in amount with depth. The surface layer ranges from weak red to brown or dark grayish brown. The subsoil is red, brown, yellow, or reddish gray. Depth to mottling is between 18 and 36 inches. In places gravel or stratified sand occur at a depth of 3 feet. The substratum ranges from silt loam or silty clay loam to fine sandy loam or gravel.

Steinsburg series

The Steinsburg series consists of moderately deep or deep, well-drained soils that formed on gray, yellowish-brown sandstone or conglomerate. They are shallow to the strongly weathered, loose, sandy material. These soils are Sols Bruns Acides that intergrade toward Lithosols. They occur on the steeper slopes in the east-central part of the county. These medium-textured and moderately coarse textured soils are underlain by moderately hard rocks, and they have a large quantity of fragments on the surface and throughout the profile. The B horizon is weakly developed and moderately coarse textured. The native vegetation consisted of oak, chestnut, hickory, and other hardwoods.

Steinsburg soils are near the Lansdale and the Penn soils and are shallower than those soils. They have more sand and fragments of sandstone throughout the profile than the Lansdale soils and, in most places, more than the Penn soils. Also, they are redder than the Penn soils. Steinsburg soils are shallower and better drained than the Readington and Croton soils. They are more sandy than the Klinesville soils but are less red and less shaly.

Profile of Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded, in a pasture south of Germantown:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure that tends toward platiness; loose when dry, very friable when moist; pH 5.2; abrupt, smooth boundary; 6 to 8 inches thick.

B2—7 to 14 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, subangular blocky structure, and weak, fine granular structure; loose when dry, friable when moist, and nonsticky and slightly plastic when wet; 15 percent fragments of soft sandstone; pH 5.2; gradual, wavy boundary; 3 to 10 inches thick.

B3—14 to 18 inches, dark-brown (10YR 4/3) and brownish-yellow (10YR 6/8) very gravelly sandy loam; weak, fine, subangular blocky structure; loose when dry, friable when moist; 80 percent fragments of soft sandstone; pH 5.2; gradual, wavy boundary; 3 to 15 inches thick.

C—18 to 36 inches, light olive-gray (5Y 6/2) to olive (5Y 4/3) very soft sandstone or sandy saprolite.

R—36 inches +, gray, somewhat weathered, moderately soft sandstone or conglomerate.

The surface layer ranges from very dark gray to dark grayish brown. The subsoil is brownish yellow to yellow or olive gray, depending on the color of the parent sandstone. The entire profile is generally sandy loam, though sand and gravel commonly increase with depth. In some places the lower subsoil is very sandy. Depth to bedrock ranges from a few inches in some severely eroded areas to 40 inches in uneroded areas, but it is ordinarily 20 to 40 inches. In many places the B horizon is very weakly developed, and in some areas it is absent. In some areas considerable amounts of sandstone fragments occur on the surface and throughout the profile. Steinsburg soils are generally medium acid to very strongly acid but are slightly acid in areas where they are influenced by limestone or diabase.

Watchung series

Soils of the Watchung series are deep, poorly drained Planosols that formed in material weathered from diabase. They occur in level to nearly level areas at the head of drainageways, along the base of slopes, and in other low level areas. These soils have a silty surface layer that abruptly overlies a silty clay loam subsoil. Boulders and stones are common in areas that have not been cleared.

Watchung soils are near the well drained Legore soils, the deep and moderately deep, well drained Montalto soils, and the moderately well drained and somewhat poorly drained Mount Lucas soils. The Watchung soils are grayer and finer textured than all those soils.

Profile of Watchung silt loam, 0 to 3 percent slopes, in a pasture south of Gettysburg (Laboratory No. S61Pa-1–35 in table 4):

A1—0 to 2 inches, black (10YR 2/1) silt loam; weak, fine, granular structure; friable when moist; pH 6.6; abrupt, smooth boundary; 1 to 3 inches thick.

A2g—2 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; common, medium, distinct mottles of brown (7.5YR 4/4) and faint mottles of light brownish gray (10YR 6/2); moderate, medium, subangular blocky structure; firm when moist; slightly sticky and plastic when wet; pH 6.6; abrupt, wavy boundary; 6 to 9 inches thick.

B21tg—9 to 18 inches, very dark gray (10YR 3/1) silty clay; common, medium, distinct mottles of brown (7.5YR 5/4); strong, medium and coarse, prismatic structure; very hard when dry, very firm when moist, sticky and plastic when wet; thick patches of clay films on peds and lining pores; pH 6.6; gradual, irregular lower boundary; 6 to 12 inches thick.

B22tg—18 to 25 inches, gray (10YR 5/1) clay; many, medium and coarse, faint mottles of olive gray (5Y 5/2) and greenish gray (5GY 5/1); moderate, medium, prismatic structure; very hard when dry, very firm when moist, and very sticky and very plastic when wet; thick, continuous clay films; pH 6.6; gradual, irregular boundary; 5 to 10 inches thick.

B3g—25 to 35 inches, gray (10YR 5/1) silty clay loam; many, medium and coarse, faint mottles of greenish gray (5GY 5/1); weak, medium, prismatic structure; friable when moist, sticky and plastic when wet; thick patches of clay films; pH 6.6; gradual, irregular boundary; 6 to 12 inches thick.

C—35 to 40 inches, olive (5Y 5/3) silt loam; common, medium and coarse, faint mottles of olive gray (5Y 4/2) and gray (10YR 5/1); weak, fine, prismatic structure; friable when moist, slightly sticky and slightly plastic when wet; thick patches of clay films; pH 6.6.

The surface layer ranges from dark grayish brown to black. The subsoil is silty clay loam to clay. The solum generally is more than 36 inches thick. Mottling may begin anywhere between the surface and a depth of 8 inches. Large diabase boulders occur in most areas. Some areas have a sandy subsoil and are better drained

than the soil described. The Watchung soils range from medium acid to neutral. Some areas are very stony and are mapped separately in this county.

Wehadkee series

The Wehadkee series consist of poorly drained Low-Humic Gley soils that occur on flood plains along the major streams of the county. These soils formed in alluvium washed from areas underlain by crystalline rocks, mostly granite, gneiss, schist, diabase, and quartzite. They occur on first bottoms of streams in the southeastern and central parts of the county.

The Wehadkee soils are the poorly drained members of the Chewacla-Wehadkee drainage sequence. In some places they are adjacent to the Worsham, Watchung, or Lehigh soils.

Profile of Wehadkee silt loam in a grass field in the Gettysburg National Military Park:

A1—0 to 5 inches, very dark grayish-brown (2.5Y 3/2) silt loam; moderate, medium and coarse, granular structure; friable when moist, slightly sticky, slightly plastic when wet; pH 6.4 (limed); clear, smooth boundary; 4 to 7 inches thick.

C1—5 to 13 inches, olive (5Y 5/3) silty clay loam; common, medium, faint mottles of olive (5Y 5/6); moderate, coarse, prismatic, structure breaking to thin platy structure; hard when dry, firm when moist, slightly sticky and very plastic when wet; thick, discontinuous clay films; some mica; pH 6.4; clear, wavy boundary; 7 to 10 inches thick.

C2g—13 to 37 inches, gray (5Y 6/1) silty clay loam; common, medium, faint mottles of olive (5Y 5/3); moderate, coarse, prismatic structure breaking to thin platy structure; hard when dry, firm when moist, sticky and very plastic when wet; thick, continuous clay films; some mica; pH 6.7; diffuse, wavy boundary; 17 to 28 inches thick.

C3g—37 inches +, gray (5Y 6/1) silty clay loam; many, medium, faint mottles of olive (5Y 5/6) and few, fine, faint mottles of olive (5Y 4/3); very thick platy structure; hard when dry, firm when moist, slightly sticky and plastic when wet; thick clay patches; pH 6.6.

The Wehadkee soils vary considerably in color and texture, depending on the origin of the sediments from which they were formed. They contain a large amount of mica where they derived mainly from gneiss and schist and a small amount where they derived from material mixed with sediments washed from other soils. In Adams County, the surface layer generally is silt loam, but many areas have thin sandy deposits on the surface. The surface layer ranges from dark grayish brown to light brownish gray, and the subsoil from mottled light gray to mottled gray. The subsoil ranges from silty clay loam to clay. Mottling ordinarily begins at a depth of about 7 inches but may begin anywhere between the surface and a depth of 12 inches. In many low spots, mottling begins at the surface, and the entire profile is very dark gray or olive. Some areas are stony. These soils range from medium acid to neutral.

Wiltshire series

The Wiltshire series consists of deep, moderately well drained Gray-Brown Podzolic soils that intergrade toward Red-Yellow Podzolic soils. Wiltshire soils are in small areas in depressions and on gently, concave lower slopes in the eastern part of the county and in the Fairfield Valley. They developed in material that weathered from limestone, mica schist, shale, and other calcareous rocks. In places the underlying rock consists of thinly bedded limestone containing closely folded beds of dark graphitic shale or slate, and in other places it consists of thicker beds of gray limestone containing mica and iron pyrite. Some of the parent material washed in from the slopes above. Although these soils formed in calcareous material, leaching has removed many of the soluble bases. Base saturation is moderately low, and only small amounts of easily weathered minerals remain. The native vegetation was a mixed hardwood forest of chestnut, white oak, red oak, hickory, maple, beech, ash, and walnut. Where these soils have been plowed, the thin organic layer has been mixed with underlying material.

Wiltshire soils are near the shallow, well-drained Hollinger soils, the deep, well-drained Conestoga soils, the somewhat poorly drained Lawrence soils, and the poorly drained Guthrie soils. Wiltshire soils are near the Athol soils in the Fairfield Valley but have finer texture and are less well drained.

Profile of Wiltshire silt loam in an idle field in Union Township, 2½ miles northeast of Littlestown:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; 2 percent coarse fragments; weak, thin, platy structure breaking to fine granular structure; very friable when moist, slightly sticky and slightly plastic when wet; pH 6.6 (limed); abrupt, smooth boundary; 9 to 11 inches thick.

B21t—9 to 19 inches, brown (7.5YR 5/4) fine silt loam; 2 to 5 percent coarse fragments; moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; thick patches of clay films on ped faces and lining the pores; pH 6.4; clear, wavy boundary; 7 to 12 inches thick.

B22t—19 to 34 inches, brown (7.5YR 5/4) fine silt loam; common, medium, distinct mottles of light brownish gray (2.5Y 6/2) and grayish brown (10YR 5/2); 5 percent coarse fragments; moderate, medium, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; thick, continuous clay films; pH 6.8; clear, smooth boundary; 13 to 18 inches thick.

Bx—34 to 48 inches, brown (10YR 5/3) silt loam; common, medium, distinct mottles of grayish brown (2.5Y 5/2); 10 percent coarse fragments; weak, medium, platy structure breaking to weak, fine, subangular blocky structure; firm when moist, slightly sticky and slightly plastic when wet; patches of clay films on ped faces and lining the pores; common black coatings and concretions; pH 6.6.

The surface layer ranges from dark brown to yellowish brown, and the subsoil is yellowish brown to light brownish gray and red. Hue is dominantly 10YR in the A horizon and 7.5YR in the B horizon. Commonly, value is 4 in the A horizon and 5 in the B horizon, and chroma is 3 or 4 in the A horizon and 4 in the B horizon. The C horizon, and in some places the B3 horizon, has a hue of 5YR, a value of 4 or 5, and a chroma of 3 or 4. The surface layer is mostly silt loam, but it is loam in some places. The subsoil ranges from heavy silt loam to clay loam. Depth to mottling ranges from 15 to 30 inches but commonly is between 18 and 20 inches. The mottles are faint and few nearest the surface, but they become common and more prominent with depth. In some places black coatings of iron and manganese occur in the lower subsoil. These soils are darker colored and less micaceous in areas where they were derived from limestone than they are in areas where they were derived from calcareous schist. A little gravel occurs throughout the profile. In some places the

profile contains chert, schist, limestone, and marble. In some areas these soils are more shaly and acid in the lower horizons than is the soil described. Depth to hard calcareous material ranges from 5 to 15 feet.

Worsham series

The Worsham series consists of poorly drained Low-Humic Gley soils in the more nearly level areas in depressions, at the foot of slopes, and at the head of drainageways. Worsham soils formed in weathered micaceous schist, phyllite, and slate that washed from higher areas. They are of small extent in this county and occur only in the extreme southeastern part.

Worsham soils are the poorly drained member of the drainage sequence that includes the shallow, well drained Manor soils, the well drained, moderately deep Glenelg soils, and the moderately well drained Glenville soils. Worsham soils are more poorly drained, more mottled, and more gray than those soils.

Profile of Worsham silt loam, 0 to 3 percent slopes, in a pasture in the extreme southeastern part of the county:

Ap—0 to 9 inches, light olive-brown (2.5Y 5/4) silt loam; moderate, coarse, granular structure, friable when moist, slightly sticky when wet; 5 percent coarse fragments; pH 6.6; many large pores and a few small pores; clear, smooth boundary; 8 to 11 inches thick.

B21g—9 to 20 inches, olive-gray (5Y 5/2) silty clay; common, fine, prominent mottles of dark red (2.5YR 3/6); thick platy structure breaking to moderate, medium, subangular blocky structure; slightly firm when moist, sticky and plastic when wet; thin, discontinuous clay films; few large pores; 5 percent coarse fragments; pH 6.0; gradual, smooth boundary; 9 to 15 inches thick.

B22g—20 to 24 inches, light olive-gray (5Y 6/2) and gray (5Y 6/1) shaly clay loam; many, medium, prominent mottles of dark red (2.5YR 3/6); coarse, medium, blocky structure breaking to thin platy structure and medium, subangular blocky structure; firm when moist, very sticky and plastic when wet; 25 percent coarse fragments; thick, continuous clay films; pH 5.8; gradual, wavy boundary; 2 to 7 inches thick.

B23g—24 to 37 inches, olive-gray (5Y 5/2) shaly clay; many, medium and coarse, prominent mottles of yellow (10YR 7/8) and gray (5Y 6/1); coarse, medium, blocky structure breaking to thin platy structure and medium subangular blocky structure; very firm when moist, sticky and plastic when wet; 30 percent coarse fragments; thick, continuous clay films; pH 5.6; gradual, irregular boundary; 10 to 17 inches thick.

C—37 inches +, 95 percent partly weathered soft schist fragments.

The surface layer ranges from olive brown to light gray, and the subsoil ranges from olive gray to grayish brown. Mottling may begin anywhere from the surface to a depth of 15 inches. The surface layer is silt loam, and the subsoil ranges from clay loam to clay. In most areas a few inches to 2 feet of recent colluvial material has accumulated on the surface. These soils contain a large amount of mica where they were derived mainly from schist. In some areas fragments of quartzite occur throughout the profile.

Laboratory Data

Samples of the Arendtsville, Brecknock, Highfield, Mount Lucas, and Reaville series were taken in Adams County and analyzed by the Soil Characterization Laboratory of the Pennsylvania State University. Samples for each of these soil series were taken at two sites where slopes and erosion were average and the soils were in a common land use. Samples of 4-quart size were collected from each horizon that could be recognized in a pit dug through the solum and into the parent material. Data obtained from the analysis of these samples are shown in table 10. The sampling and the analytical methods used are discussed in the paragraphs that follow.

In all the chemical procedures used in testing, air-dry samples were crushed with a rolling pin so that the material would pass through a sieve with round 2-millimeter holes, but care was taken to avoid fragmenting the non-soil material. In table 10 the percentage of material retained by the sieve is reported in the column headed "Coarse fragments greater than 2 mm." All laboratory determinations except those for bulk density are for only that part of the sample consisting of particles less than 2 millimeters in diameter.

Bulk density, expressed in grams per cubic centimeter, was determined on 1- by 2-inch cylindrical core samples taken in a modified Uhland core sampler (*9*, *15*).

Moisture retention at a tension of 1/3 atmosphere was determined by testing core samples on a porous plate (*9*). Moisture held at a tension of 15 atmospheres was determined by testing fragmented samples in a pressure-membrane apparatus (*10*).

Analysis for particle-size distribution was made by the pipette method, as described by Kilmer and Alexander (*5*) and Kilmer and Mullins (*6*). Mechanical shaking was used to disperse the particles in sodium hexametaphosphate.

The reaction was determined by using the Beckman zeromatic pH meter and a soil-water ratio of 1:1.

Organic carbon was determined by wet combustion; the procedure was a modification of the Walkley-Black method (*7*).

Total nitrogen was determined by the Kjeldahl method (*3*), modified by trapping ammonia in a boric acid solution and titrating with sulfuric acid.

Extractable hydrogen, calcium, magnesium, and the cation exchange capacity were determined by extraction with neutral normal ammonium acetate (*7*). The cation exchange capacity was determined by summation of exchangeable cations and the distillation of absorbed ammonia after extraction with sodium chloride. Extractable sodium and potassium were determined by using a model 52a Perkin-Elmer flame photometer.

The clay minerals in selected horizons of the soils sampled for characterization were interpreted by Dr. L. J. Johnson of the Pennsylvania State University.

The following procedure was used. The soil was air dried and sieved, and the coarse particles were removed. The fines were treated with hydrogen peroxide to destroy the organic matter. The iron oxide coatings were reduced and removed by treatment with oxalic acid, potassium oxalate, and magnesium ribbon. The clay was separated with a centrifuge. One portion of the clay was saturated with potassium, placed on slides, and air dried. These slides were heated to 300° C., and an X-ray tracing was made. The slides were then heated to 500° C., and another X-ray tracing was made. Another portion of the clay was saturated with magnesium, placed on slides, air dried, and a diffraction tracing was made. These

slides were then saturated with ethylene glycol, and another tracing was made.

Dr. Johnson interpreted the traces on the basis of peak heights and the relationship to known clay mixtures. The following kinds of clay minerals were identified on the basis of the procedure described and the following spacings: kaolinite, 7 angstroms (Å); illite, 10 angstroms; vermiculite, variable spacing; montmorillonite, variable spacing; chlorite, 14 angstroms; and interstratified, combinations of 2:1 lattice clay minerals, such as illite, vermiculite, montmorillonite, and chlorite.

The information obtained by these analyses can be used to check field observations made by less precise methods such as the determination of texture by feel. The results of the physical tests can be used to determine the engineering properties of soils, the response of soils to tillage, and the ability of soils to absorb, transmit, and store moisture that plants use.

The chemical tests indicate the degree of leaching of the soils and the ability of the soils to hold and to supply plant nutrients. The tests are also helpful in determining the amount of liming materials needed to lower the acidity of the soil. Extractable cations can be used as a basis for estimating the fertility of the soil.

Texture, reaction, percentage of base saturation, and other characteristics are used as a basis for placing soils in the higher categories of the new soil classification system.

Summarized and explained in the following paragraphs, for each soil tested, are some of the data reported in table 10. Profiles of the soils tested are described in the subsection "Descriptions of the Soil Series."

Arendtsville Gravelly Loam
S61Pa-1-8-(1-6) and S61Pa-1-9-(1-7)

The mechanical analysis of the samples of this soil shows that the soil is medium-textured to moderately coarse textured and has a content of coarse fragments (more than 2 millimeters) ranging from 11 to 45 percent. Many particles of shale probably are coarse grains of sand. The content of sand ranges from 27 to 72 percent. Silt-sized particles range from 17 to 50 percent and decrease in amount with increasing depth. Clay, which ranges from 10 to 29 percent, increases in amount to a depth of about 24 inches and then decreases, for clay has accumulated in the B horizon. Kaolinite is the most common clay mineral. Because of the thickness of the solum and of the content of clay, the available moisture capacity is high and, on the average, amounts to about 10 inches in the entire profile.

The pH drops sharply in the lower horizons. Because these samples were taken in orchards, any liming that may have been done probably was fairly recent, after the use of cover crops in orchards became customary. The acidity in the lower horizons may be a result of an accumulation of chemicals from sulfur or other acid sprays that were formerly used in large quantities.

Base saturation follows the general pattern of the pH values and decreases with depth. It ranges from 71 to 27 percent. The cation exchange capacity also decreases with depth; it ranges from 13 to 6 percent.

Brecknock Silt Loam
S61Pa-1-14-(1-6) and S61Pa-1-15-(1-5)

Mechanical analysis shows that this soil is medium textured but contains coarse fragments amounting to 10 to 70 percent. Samples S61Pa-1-15-(1-5) had considerably more fragments of shale and more sand than samples S61Pa-1-14-(1-6). The content of sand in the two profiles ranges from 45 to 20 percent. The content of silt ranges from 72 to 35 percent and is less in the lower part of the profile. Because of its high content of coarse fragments, this soil may be droughty. The average available moisture capacity is about 7½ inches in a profile.

Base saturation ranges from 89 to 44 percent in the two profiles. Base saturation and pH values indicate that this soil has been adequately limed, Brecknock soils are naturally strongly acid. The cation exchange capacity ranges from 13 to 22 milliequivalents per 100 grams of soil. These values indicate a moderate natural fertility. Organic carbon is high in the A horizon but drops sharply with increasing depth. This drop reflects the influence of vegetation on the surface layer.

The samples of both profiles show that the content of clay of the B horizon has increased somewhat and that the clay may have continued its movement into the C horizon. The clay consists of kaolinite, illite, and vermiculite in about equal proportions. Differences in percent of about 10 between ⅓ atmosphere and 15 atmospheres of moisture tension and adequate bulk density indicate that the available moisture capacity is adequate, but the capacity for holding moisture may be reduced by the high content of coarse fragments.

Highfield Channery Silt Loam
S61Pa-1-11-(1-6) and S61Pa-1-12-(1-7)

The mechanical analysis of the samples of this soil shows that the soil is medium textured and contains a significant amount of coarse fragments. The content of sand ranges from 49 to 23 percent. Silt-sized particles range from 60 to 45 percent. The content of clay ranges from 21 to 5 percent and is higher in the B horizon than in the A. Samples S61Pa-1-12-(1-7) had less clay than samples S61Pa-1-11-(1-6). Samples S61Pa-1-11-(1-6) are high in kaolinite and illite. Samples S61Pa-1-12-(1-7) are dominantly interstratified clay that was apparently inherited from greenstone metarhyolite in the parent material. The available moisture capacity is moderate to high and, on the average, amounts to about 8 inches in the entire profile.

The pH values are fairly constant for the samples at both locations and indicate medium acid and slightly acid reaction.

Base saturation ranges from 82 to 48 percent in one profile and from 6 to 74 in the other. In milliequivalents per 100 grams of soil, the cation exchange capacity ranges from a low of 4.9 in one profile to a high of 20.7 in the other. These values indicate low to moderate natural fertility.

Mount Lucas Silt Loam
S61Pa-1-16-(1-6) and S61Pa-1-17-(1-6)

Mechanical analysis shows that this soil is medium textured in the upper horizons, moderately coarse textured in the lower horizons, and contains coarse fragments ranging from 2 to 13 percent. The content of sand ranges from 79 to 19 percent and is considerably more in the C horizon than in the upper horizons. Silt, which ranges from 68

TABLE 10.—*Analytical data*

[Absence of data indicates

Soil name, sample number, and location	Horizon	Depth	Coarse fragments (greater than 2 mm.)	Particle-size distribution							Bulk density	Moisture held at—	
				Very coarse sand (2.0 to 1.0 mm.)	Coarse sand (1.0 to 0.5 mm.)	Medium sand (0.5 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)		1/3 atmosphere (core)	15 atmospheres (fragments)
		Inches	*Percent by weight*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*		*Percent*	*Percent*
Arendtsville gravelly loam: S61Pa-1-8-(1-6)	Ap	0-9	44	6.9	10.2	14.9	12.9	8.6	35.6	10.9	------	------	6.0
	B1	9-16	21	3.5	8.7	13.7	14.3	9.9	37.4	12.5	------	------	5.0
	B21t	16-28	20	3.4	7.0	13.9	16.7	11.8	26.6	20.6	1.62	16.0	8.8
	B22t	28-40	11	1.9	6.4	13.9	18.1	13.7	26.1	19.9	1.69	17.0	8.2
	B3	40-53	21	6.2	12.8	18.0	19.7	11.5	17.4	14.4	1.78	14.7	6.0
	C	53-68+	29	6.3	14.2	21.7	19.2	10.3	18.0	10.3	------	------	5.7
Arendtsville gravelly loam: S61Pa-1-9-(1-7)	Ap	0-9	33	5.7	8.3	6.2	10.2	6.7	47.3	15.6	------	------	10.1
	B1	9-14	27	7.1	7.0	7.3	6.0	.3	49.7	22.6	------	------	10.2
	B21t	14-20	45	6.0	6.7	7.3	6.4	5.0	40.7	27.9	------	------	13.6
	B22t	20-25	31	5.3	6.7	7.1	6.0	6.2	39.2	29.5	------	------	14.9
	B23	25-37	32	4.9	8.1	9.1	7.1	6.0	37.1	27.7	------	------	13.6
	C1	37-53	28	4.8	7.5	8.8	7.0	5.9	41.9	24.1	------	------	12.3
	C2	53-73+	37	4.8	9.9	11.1	8.7	6.1	35.0	24.4	------	------	9.6
Brecknock silt loam: S61Pa-1-14-(1-6)	Ap	0-6	15	5.1	4.0	2.7	2.7	3.8	72.7	9.0	1.34	29.1	10.1
	A3	6-10	15	4.5	3.3	2.8	2.7	3.9	72.8	10.0	1.58	21.8	7.4
	B1	10-14	16	3.9	4.6	3.3	2.6	3.3	67.6	14.7	1.84	18.9	8.4
	B2t	14-18	15	6.0	8.3	4.4	2.8	3.6	56.9	18.0	1.48	22.9	10.0
	B3	18-27	23	3.7	5.6	4.8	4.2	4.5	54.4	22.8	1.58	23.2	12.4
	C	27-44	10	3.3	4.9	4.4	4.5	4.2	55.1	23.6	1.64	21.3	12.3
Brecknock silt loam: S61Pa-1-15-(1-5)	Ap	0-9	23	7.2	6.4	3.7	2.7	3.1	58.4	18.5	1.46	24.2	9.1
	B21t	9-14	43	7.8	6.1	3.1	1.9	1.3	51.2	28.6	1.43	24.3	12.8
	B22t	14-22	61	9.9	8.4	3.9	2.1	1.9	50.7	23.1	1.56	21.6	11.7
	B3	22-28	66	12.2	10.8	6.3	3.8	2.8	42.3	21.8	1.68	20.0	11.2
	C	28-38	70	19.8	14.3	6.1	2.5	1.7	35.5	20.1	------	------	9.9
Highfield channery silt loam: S61Pa-1-11-(1-6)	Ap	0-10	29	6.4	6.0	4.6	3.9	2.8	56.9	19.4	1.37	22.9	8.2
	B21t	10-17	31	6.9	6.9	5.3	3.9	3.8	51.4	21.8	1.52	21.4	8.8
	B22t	17-25	35	12.7	10.2	6.6	4.7	.1	49.7	16.0	1.41	20.9	5.6
	B23t	25-30	34	11.2	8.9	6.1	3.9	3.2	50.4	16.3	1.56	19.8	5.5
	B3	30-39	44	8.9	8.1	5.9	4.5	3.0	51.9	17.7	1.60	20.8	5.3
	C	39-45	58	6.5	7.1	5.3	4.7	4.5	60.3	11.6	------	------	5.3
Highfield channery silt loam: S61Pa-1-12-(1-7)	Ap	0-9	43	11.0	7.8	6.3	5.5	8.3	55.9	5.2	1.55	20.4	7.3
	A3	9-12	39	9.0	8.4	5.9	5.9	7.6	49.3	13.9	1.57	19.4	6.1
	B21t	12-18	42	8.0	7.5	5.9	6.7	6.4	54.0	11.5	1.70	18.4	6.8
	B22t	18-24	36	5.8	7.1	6.3	7.3	10.6	52.5	10.4	1.77	18.8	7.0
	B23	24-32	44	5.6	6.8	6.9	8.9	10.6	51.8	9.4	1.63	21.3	6.7
	B3	32-38	49	7.2	7.2	7.6	9.7	11.8	48.4	8.1	1.64	21.3	6.2
	C	38-42	55	7.7	10.1	10.0	11.4	9.8	45.1	5.9	------	------	5.2
Mount Lucas silt loam: S61Pa-1-16-(1-6)	Ap	0-8	2	1.8	4.3	4.2	4.7	4.7	68.1	12.2	1.45	22.9	7.4
	B1	8-11	3	3.2	5.1	3.8	3.6	4.1	56.7	23.5	1.52	21.9	11.8
	B21t	11-18	13	6.2	10.6	5.9	4.7	5.9	40.1	26.6	1.50	27.4	15.2
	B22t	18-24	11	6.9	12.2	8.1	7.6	9.0	31.5	24.7	1.54	26.9	15.3
	B3	24-28	7	6.9	16.5	10.5	9.4	9.8	25.5	21.4	1.60	25.0	14.2
	C	28-39+	7	18.5	26.7	14.9	11.7	7.9	14.1	6.2	1.77	1.46	9.4

See footnote at end of table.

for selected soil profiles

value is not determined]

Organic carbon	Nitrogen	Carbon-nitrogen ratio	Extractable cations					Cation exchange capacity (sum)	Base saturation	pH	Calcium-magnesium ratio	Mineral composition of clay fraction					
			Ca	Mg	Na	K	H					Kaolinite	Illite	Vermiculite	Montmorillonite	Chlorite	Interstratified
Percent	*Percent*		*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Percent*			*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1.12	0.103	10.9	5.5	0.6	0.1	0.6	2.8	9.6	71	6.8	(1)	25	30	------	------	5	40
.23	.043	(1)	3.8	.6	.1	.1	2.4	7.0	66	6.9	(1)	------	------	------	------	------	------
.08	------	------	5.4	.6	.1	.1	2.2	8.4	74	6.5	(1)	40	40	15	5	5	5
.04	------	------	3.3	.5	.1	.1	2.6	6.6	61	5.1	(1)	------	------	------	------	------	
.02	------	------	1.5	.5	.1	.1	4.3	6.5	34	4.7	(1)	------	------	------	------	------	
.02	------	------	.9	.6	.1	.1	4.7	6.4	27	4.7	(1)	40	30	10	5	5	5
1.42	.142	10.0	5.9	1.7	.1	.4	4.9	13.0	62	6.2	3.5	40	10	------	------	------	30
.33	.054	6.1	4.6	1.1	.1	.3	2.4	8.5	72	6.7	4.2	------	------	------	------	------	------
.19	------	------	5.7	1.1	.1	.2	3.3	10.4	68	6.6	5.2	55	10	------	5	------	10
.15	------	------	5.9	.9	.1	.2	2.2	9.3	76	6.5	(1)	50	5	10	5	5	5
.04	------	------	3.9	.9	.1	.1	3.8	8.8	57	5.5	(1)	------	------	------	------	------	
.02	------	------	1.0	.7	.1	.1	5.0	6.9	28	4.9	(1)	55	5	5	5	5	5
.02	------	------	1.5	.8	.1	.1	5.7	8.2	30	4.8	(1)	------	------	------	------	------	
2.19	.221	9.9	10.6	1.8	.2	.2	6.6	19.4	66	6.0	5.9	30	15	30	------	5	20
.92	.102	9.0	16.8	1.4	.3	.3	4.0	22.8	82	6.7	12.0	------	------	------	------	------	------
.27	------	------	8.0	1.6	.3	.1	3.4	13.4	75	6.8	5.0	40	20	25	------	------	15
.10	------	------	8.6	2.5	.6	.1	3.4	15.2	78	6.8	3.4	------	------	------	------	------	------
.06	------	------	12.3	4.4	.8	.2	3.4	21.1	84	6.7	2.8	40	30	25	------	------	5
.04	------	------	12.5	6.6	.9	.2	2.4	22.6	89	6.7	1.9	------	------	------	------	------	
1.23	.126	9.8	9.7	2.3	.3	.3	5.1	17.7	71	6.7	4.2	35	30	25	------	------	10
.27	.056	4.8	8.4	2.0	.3	.3	5.7	16.7	66	6.7	4.2	------	------	------	------	------	------
.21	------	------	4.7	3.0	.3	.2	8.5	16.7	49	5.1	1.6	25	40	25	------	5	5
.12	------	------	2.6	4.3	.4	.3	9.8	17.4	44	4.9	.6	------	------	------	------	------	
.12	------	------	2.9	4.0	.2	.3	8.9	16.3	45	5.0	.7	20	50	20	------	10	
1.39	.124	11.2	4.3	.8	.3	.2	2.4	8.0	70	5.9	(1)	------	------	------	------	------	
.25	.042	6.0	3.3	.9	.4	.2	1.9	6.7	72	6.2	(1)	------	------	------	------	------	
.17	------	------	3.1	.7	.3	.2	1.5	5.8	74	6.2	(1)	40	35	15	10	------	
.08	------	------	2.5	.5	.3	.2	1.4	4.9	71	6.3	(1)	40	50	5	5	------	
.06	------	------	3.4	.7	.2	.2	1.9	6.4	70	6.2	(1)	------	------	------	------	------	
.08	------	------	2.3	.9	.9	.2	2.1	6.4	67	5.8	(1)	45	45	5	5	------	
1.58	.151	10.5	6.4	1.2	.2	.4	7.2	15.4	53	6.3	5.3	20	20	------	------	------	60
.45	.052	8.7	4.5	.9	.1	.2	5.8	11.5	50	6.2	(1)	------	------	------	------	------	
.21	------	------	4.9	1.1	.1	.1	6.7	12.9	48	6.3	4.5	20	10	------	------	------	70
.12	------	------	6.3	1.5	.2	.1	6.8	14.9	54	6.1	4.2	------	------	------	------	------	------
.02	------	------	11.0	2.2	.2	.1	5.5	19.0	71	5.8	5.0	20	5	------	------	------	75
.04	------	------	13.5	2.7	.4	.1	4.0	20.7	81	5.9	5.0	------	------	------	------	------	------
.03	------	------	13.7	2.8	.3	.1	3.8	20.7	82	6.2	4.9	20	5	------	------	------	75
.73	.098	7.4	7.6	3.2	.2	.1	4.1	15.2	73	6.5	2.4	40	30	------	15	5	10
.31	.049	6.3	9.8	5.5	.2	.1	4.9	20.5	76	6.6	1.8	------	------	------	------	------	------
.29	.047	6.2	12.9	9.8	.2	.1	5.3	28.3	81	6.5	1.3	40	20	------	25	5	10
.19	------	------	13.5	11.9	.3	.1	5.7	31.5	82	6.6	1.1	------	------	------	------	------	------
.08	------	------	14.7	13.1	.3	.1	1.1	29.3	96	6.7	1.1	------	------	------	------	------	------
.02	------	------	7.5	6.1	.3	.1	1.2	15.2	92	6.9	1.2	30	10	------	50	------	10

TABLE 10.—*Analytical data for*

Soil name, sample number, and location	Horizon	Depth	Coarse fragments (greater than 2 mm.)	Particle-size distribution							Bulk density	Moisture held at—	
				Very coarse sand (2.0 to 1.0 mm.)	Coarse sand (1.0 to 0.5 mm.)	Medium sand (0.5 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)		1/3 atmosphere (core)	15 atmospheres (fragments)
		Inches	*Percent by weight*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*		*Percent*	*Percent*
Mount Lucas silt loam: S61Pa-1-17-(1-6)	Ap	0-7	6	2.9	7.3	8.5	9.2	8.5	46.8	16.8	1.67	20.4	10.2
	B21t	7-15	10	4.5	10.0	8.6	7.6	7.4	40.0	21.9	1.53	22.8	13.6
	B22t	15-21	6	4.4	13.3	10.1	9.4	7.9	38.6	16.3	1.55	24.8	12.8
	B23	21-26	6	7.3	15.1	11.9	9.9	8.3	31.9	15.6	1.52	22.7	11.4
	B3	26-33	2	2.8	17.4	15.3	14.4	11.4	27.6	11.1	1.51	23.9	9.5
	C	33-38	4	7.6	22.3	17.7	17.2	12.7	19.4	3.1	1.70	15.6	5.6
Reaville shaly silt loam: S61Pa-1-10-(1-4)	Ap	0-8	12	9.0	8.3	4.3	2.2	2.4	59.1	14.7	1.54	24.2	10.2
	B2t	8-12	30	5.2	6.5	3.1	1.6	2.7	59.8	21.1	1.53	22.5	9.3
	B3	12-15	57	5.5	6.6	3.1	1.6	3.1	59.0	21.1	1.52	23.5	9.3
	C	15-22	71	5.3	7.1	3.9	2.1	3.4	58.1	20.1	------	------	9.0
Reaville shaly silt loam: S61Pa-1-13-(1-4)	Ap	0-9	16	13.0	10.1	6.0	3.0	2.5	53.6	11.8	1.34	25.5	9.7
	B2t	9-13	30	11.6	12.7	6.2	3.1	2.8	45.5	18.1	1.49	22.7	8.6
	B3	13-15	45	9.0	11.0	7.2	4.1	4.1	45.7	18.9	1.48	23.2	8.0
	C	15-25	65	11.1	10.1	5.3	3.5	4.2	44.0	21.8	1.49	22.3	8.1

[1] Values considered not representative of the natural soil, or were based on numerical results too low for meaningful interpretations.

to 14 percent, decreases lower in the profile. The content of clay ranges from 3 to 26 percent, and the distribution of clay indicates the movement of clay into the B horizon. This soil contains more montmorillonite than the other soils sampled in the county. The montmorillonite is inherited from the saprolite parent material and is enhanced by restricted drainage. Because of the thickness of the solum and of the texture of the soil, the available moisture capacity is moderate to moderately high and amounts to about 7 inches in the entire profile.

The pH increases slightly in the lower horizons.

Base saturation ranges from 96 to 73 percent and is slightly higher in the lower horizons. Higher base saturation in the lower horizons may reflect the basic nature of the parent material. The cation exchange capacity ranges from 31 to 14 milliequivalents per 100 grams of soil. Organic carbon ranges from 0.89 to 0.02 percent and drops sharply below the Ap horizon.

Reaville Shaly Silt Loam
S61Pa-1-10-(1-4) and S61Pa-1-13-(1-4)

Mechanical analysis shows that this soil is medium textured but contains coarse fragments amounting to 12 to 71 percent. The number of coarse fragments is greatest in the lower horizons. The B3 and C horizons are skeletal. The content of sand ranges from 36 to 19 percent. Silt-sized particles range from 44 to almost 60 percent and decrease very slightly with increasing depth. The content of clay ranges from 11 to 21 percent and is highest in the B and C horizons. Indications are that the movement of clay continues on into the C horizon. The mineral composition of clay is mixed and shows some effect of the parent shale and siltstone. The depth to bedrock limits the amount of moisture available for plants.

The pH ranges from 6.9 to 5.7 in the two profiles. Base saturation ranges from 52 to 76 percent and is higher in the lower part of the profile. The pH value and base saturation indicate that this soil has been adequately limed. The cation exchange capacity ranges from 6 to14 milliequivalents per 100 grams of soil. These values indicate low or moderately low natural fertility. Organic carbon ranges from 1.42 percent in the Ap horizon to 0.12 percent in the lower subsoil.

Additional Facts About Adams County

This section discusses physiography and geology, water supply, climate, agriculture, and other subjects of general interest. Unless otherwise stated, the statistics in this section are from reports published by the U.S. Bureau of the Census.

Physiography, Geology, and Drainage

Adams County is located partly in the Blue Ridge Province and partly on the Piedmont Plateau. South Mountain, a part of the Blue Ridge Mountains, is in the northwestern part of the county. The rest of the county is a dissected plain, a low part of the Piedmont Province called

selected soil profiles—Continued

Organic carbon	Nitrogen	Carbon-nitrogen ratio	Extractable cations					Cation exchange capacity (sum)	Base saturation	pH	Calcium-magnesium ratio	Mineral composition of clay fraction					
			Ca	Mg	Na	K	H					Koalinite	Illite	Vermiculite	Montmorillonite	Chlorite	Interstratified
Percent	*Percent*		*Meq./ 100 gm.*	*Meq./ 100 gm.*	*Meq./ 100 gm.*	*Meq./ 100 gm.*	*Meq./ 100 gm.*	*Meq./ 100 gm.*	*Percent*			*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
0. 89	0. 105	8. 5	11. 8	3. 0	0. 2	0. 1	3. 8	18. 9	80	6. 5	3. 9	55	20	------	10	------	15
. 19	. 045	(1)	12. 2	4. 6	. 4	. 1	3. 6	20. 9	83	6. 9	2. 7	------	------	------	------	------	
. 17	. 036	(1)	11. 1	5. 5	. 3	. 1	3. 3	20. 3	84	6. 8	2. 0	60	10	------	20	------	10
. 19	. 029	6. 6	9. 6	5. 5	. 4	. 1	2. 1	17. 7	88	6. 7	1. 7	------	------	------	------	------	
. 10	------	------	8. 3	5. 2	. 4	. 1	1. 8	15. 8	89	6. 9	1. 6	60	15	------	20	------	5
. 02	------	------	7. 3	4. 9	. 2	. 1	1. 6	14. 1	89	7. 0	1. 5	------	------	------	------	------	
1. 42	. 147	9. 7	6. 7	1. 7	. 3	. 2	5. 5	14. 4	62	6. 4	3. 9	20	40	10	-----	----	30
. 25	. 044	5. 7	3. 5	1. 8	. 3	. 1	3. 3	9. 0	63	6. 5	1. 9	20	45	30	------	------	5
. 12	------	------	3. 7	2. 6	. 2	. 1	2. 5	9. 1	73	6. 3	1. 4	------	------	------	------	------	
. 15	------	------	2. 4	1. 8	. 2	. 2	1. 9	6. 5	71	5. 7	1. 3	25	45	25	------	------	5
. 86	. 124	6. 9	3. 2	1. 4	. 2	. 1	4. 6	9. 5	52	6. 9	2. 3	25	35	5	------	5	30
. 31	. 059	5. 3	5. 6	2. 7	. 5	. 1	4. 3	13. 2	67	6. 9	2. 1	30	35	5	------	5	25
. 19	------	------	5. 2	3. 3	. 4	. 1	5. 5	14. 5	62	6. 8	1. 6	------	------	------	------	------	
. 14	------	------	4. 9	4. 2	. 5	. 1	3. 1	12. 8	76	6. 8	1. 2	30	35	5	------	5	25

the Gettysburg Plain. Longitudinal folds and thrust faults characterize the rocks in South Mountain. The Triassic rocks generally have not been subjected to folding and thrusting (*11*).

The metamorphosed rocks include quartzite and slate of Cambrian age in South Mountain, Pigeon Hills, and the slate hills southeast of Littlestown. Limestone of Cambrian and Ordovician age occurs near Fairfield and Hanover. Soft sandstone and shale of Triassic age occurs in the Gettysburg Plain (*12*).

The igneous rocks are volcanics and diabase intrusions. The volcanics in the South Mountain and the Pigeon Hills are thought to be of Algonkian age. The diabase intrusions are much younger and penetrate the Triassic strata of the Gettysburg Plain. The Triassic rocks, which are the New Oxford formation and Gettysburg shale, belong to the Newark group and underlie about one-half of the county. These rocks are in thick beds that generally dip toward the northwest at an average angle of about 20° (*11*).

Some rock formations in the county have been mined for building stone, granulated greenstone, limestone, brick clay and shale, vein quartz, brown iron ore, and magnetite.

The county is located on two main watersheds. The northern half drains northeastward into the Susquehanna River, and the southern half drains into the Potomac River. In the mountains the streams generally have a steep gradient and flow swiftly, mostly in narrow valleys. In the lowlands the gradients are much less and the valleys are wider and have flat bottoms. Some of the valleys have fairly wide flood plains. Streams that head in the mountains are bordered, in places, by terraces covered with sand, gravel, and cobbles brought down from the mountains. The streams were formerly dammed at many points so that water power could be used to run the local gristmills and sawmills.

Water Supply

During spring and early in summer, the flow of most streams in the county is adequate to provide water for local use, but during dry periods the flow of all streams is low. Conewago Creek, the largest stream, had a flow of only about 3,000 gallons per minute when it was checked at East Berlin one dry summer. Except for a few flash floods in the mountains after heavy storms, the streams in the county seldom overflow.

Many wells in Adams County do not produce an adequate supply of water. Small to large quantities are produced in wells drilled in areas underlain by limestone. In these limestone areas, ground water travels for long distances in caverns and little is filtered. The largest part of the county is underlain by sandstone and shale of Triassic age, formations in which not much water is available. These formations, however, are the largest and surest source of water in the county.

Diabase, or trap rock, is a poor waterbearer. It is dense and very hard to drill. The water that is obtained from diabase generally comes from the weathered zone above the hard rock. Springs were a source of water for the early

settlers. Many farms were located in the area around Fairfield underlain by limestone. Springs, except for a few large ones, do not produce enough water to supply modern appliances.

Many wells in Adams County yield disappointingly. One driller reports that of 33 wells, ranging from 25 to 200 feet in depth, only one produced as much as 30 gallons per minute. Wells more than 200 feet deep produce from only 4 to 235 gallons per minute. Drilling wells for irrigation purposes is expensive, and sufficient water is not insured.

The central lowland of Adams County is underlain by Triassic rocks that are chiefly red and brown sandstone. Areas of this sandstone are interspersed with small areas of shale, sandstone, and conglomerate of other colors. In these Triassic rocks, the surest source of water in the county, wells of less than 250 feet deep produce 50 gallons or more per minute, except where shale alone is encountered. In these places only 2 to 10 gallons per minute are produced.

The county has more than 600 farm ponds that range from one-tenth of an acre to 9 acres in surface areas. Ponds of 9 acres have a storage capacity of more than 100 acre-feet, or more than 35,000,000 gallons of water. Ponds are used for irrigation and for fire protection, watering livestock, raising fish, and recreation. The average farm pond is about one-half acre in size and is too small to irrigate any area except a very small one. A pond large enough to irrigate a large area is generally impractical, because it is expensive to build, and during dry periods when water is needed most, the rate of recharge is slowest.

The 12 public water companies in Adams County daily supply more than 1,306,000 gallons of water to 5,228 customers. Water consumption averages 60 gallons a day per person and is rising steadily. Only two communities, Gettysburg and New Oxford, obtain water from streams. The other communities obtain water from springs or wells.

Climate [7]

The climate of Adams County is mild because of the moderating influence of the Appalachian Mountains in central Pennsylvania and, to a lesser extent, because of South Mountain along the western border of the county. The exceptionally high and low temperatures of the midwestern United States do not occur. Precipitation is adequate and normally well enough distributed to supply ample moisture for crops. Since the prevailing winds are from the west, the Atlantic Ocean has only a limited influence on the climate, though at times its influence is greater than normal.

The weather in Adams County is variable and tends to change every few days. During winter and spring, noticeable changes occur daily, but during summer such changes are less frequent. At times, primarily from June through October, the weather remains essentially the same for as long as a week or more. During these periods, days may be hot and humid in summer and nights are warm. In fall these periods of unchanging weather are generally mild and dry. One or more of these periods can be expected in summer and fall, though in some summers excessive heat does not occur. From December through February, cold spells that last 4 or 5 days occur on the average of 1 to 3 per winter.

Because elevation and slope differ markedly within short distances, there are local differences in climate in the county. For example, the South Mountain area has a different temperature and precipitation regime than the rest of the county. Although elevations throughout the county are generally less than 700 feet, air drainage is good in most sections because the topography is undulating or rolling. Good air drainage is especially important to agriculture because it lessens the danger of freezing late in spring and early in fall.

Data on temperature and precipitation at Gettysburg are given in table 11. This weather station has been moved several times, but it has always been at an elevation between 500 and 550 feet. The climatic details discussed in the following paragraphs are based on the records at Gettysburg unless stated otherwise.

Temperature

Except for the mountainous areas, temperatures in Adams County are among the mildest in Pennsylvania. The average annual temperature is nearly 54° F., and the monthly average ranges from 32° in January to 76° in July. The monthly average temperature is above 50° from April through October. The temperatures generally remain between 10° and 90°, but extremes of −20° and 105° have been reported in the county. At Gettysburg extremes range from −14° to 104°. Because they are representative of areas less than 700 feet in elevation, the data on temperature given in table 11 are most useful for planning purposes in the central and eastern parts of the county.

Temperatures of 90° or higher normally occur on an average of 26 days per year from May through September. These temperatures average 11 days in July. Occasionally a temperature of 90° is reported during April and October. Temperatures of 100° or higher occur about once every 2 or 3 years, but there have been summers when a reading of 100° or higher has been observed on as many as 6 days. Temperatures of 0° or lower occur on an average of only once every other year, though these low temperatures have occurred three times in a January. In nearly two-thirds of the winters, the temperature does not fall below 0°. At higher elevations, especially in the South Mountain area, a temperature of 90° or higher is considerably less frequent than in the rest of the county, and a temperature of 0° or lower is more frequent.

Daily variations in temperature are normally 15° to 20°, depending on the season. These variations are greatest in summer. Pronounced changes in temperature within a short period are rare, but at times in winter and early in spring rapidly moving cold air may cause a drop in temperature of 30° to 40° within 24 hours. On the other hand, noticeable warming trends usually are not so abrupt.

The interval between the last 32° temperature in spring and the first in fall is generally known as the growing season. It extends normally from April 21 to October 18, or 180 days. At Gettysburg, the shortest growing season on record was 127 days and extended from May 17 to September 21; the longest growing season was 199 days and extended from April 18 to November 3. Table 12 gives

[7] By NELSON M. KAUFFMAN, State climatologist, U.S. Weather Bureau, Harrisburg, Pa.

TABLE 11.—*Temperature and precipitation for Adams County*

[All data from records kept at Gettysburg]

Month	Temperature				Precipitation					
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Snow		
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	Average monthly total	Average number of days with depth of—	
									1 inch or more	6 inches or more
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*	*Number*	*Number*
January	39	25	54	8	2.9	1.1	5.5	6.4	7	2
February	42	25	55	9	2.5	1.3	4.2	5.6	7	2
March	51	31	72	20	3.8	1.6	6.3	6.5	5	2
April	64	41	81	31	3.5	1.7	6.5	.2	(1)	
May	75	52	87	40	4.1	1.4	6.7			
June	83	61	93	50	3.5	1.7	5.5			
July	87	65	95	56	4.2	1.6	8.0			
August	85	63	95	53	4.2	1.6	8.9			
September	78	56	91	42	3.3	.7	5.6			
October	67	45	82	34	3.3	1.0	5.9	.1		
November	54	35	73	24	3.3	.8	6.4	.9	(1)	
December	42	26	58	12	2.6	.8	5.4	4.2	6	2
Year	64	44	[2] 97	[3] 1	41.2	32.6	52.8	23.9	25	8

[1] Less than 0.5 day.
[2] Average annual highest temperature.
[3] Average annual lowest temperature.

TABLE 12.—*Probabilities of the last freezing temperatures in spring and the first in fall at Gettysburg*

Probability	Dates for given probability at temperature of—				
	16° or lower	20° or lower	24° or lower	28° or lower	32° or lower
Spring:					
1 year in 10, later than	March 21	March 30	April 6	April 19	May 3
2 years in 10, later than	March 13	March 24	April 1	April 14	April 30
5 years in 10, later than	February 28	March 11	March 21	April 4	April 21
Fall:					
1 year in 10, earlier than	November 24	November 17	November 3	October 23	October 3
2 years in 10, earlier than	November 29	November 22	November 7	October 28	October 8
5 years in 10, earlier than	December 9	December 2	November 18	November 7	October 18

probabilities of the last temperatures of as low as 16°, 20°, 24°, 28°, and 32° in spring and the first in fall at Gettysburg. The information in table 12 can be applied in other parts of the county where elevation and air drainage are similar.

Precipitation

The annual precipitation ranges from about 42 inches in the eastern and northern parts of the county to about 45 inches in the South Mountain area. The distribution of this precipitation throughout the year is favorable for farming. About 55 percent of the annual rainfall normally occurs from April through September, and in only a few years is the rainfall in that period as little as 34 percent of the annual. Variations, however, are considerable from month to month and within a month. The total rainfall for the wettest month recorded is 15.1 inches, and the total for the driest month is 0.1 inch. Occasionally, during the period from April through November, 2 or 3 inches of rain falls in 24 hours, and as much as 5.5 inches have been reported in July. The water supply is generally adequate for farm, industrial, and home use. Extended droughts are not common, but an occasional dry spell may affect the entire county.

Snowfalls are frequent and sometimes heavy from December to mid-March. In March heavy wet snow may damage fruit trees, utility lines, and other exposed objects. At Gettysburg a total monthly snowfall has been as much as 25 inches in March, 23 inches in February, 23

inches in January, 19 inches in December, and 10 inches in November. Monthly totals of 5 to 15 inches are fairly common from December through March. Measurable amounts of snow have fallen as early as October 19 and as late as April 9. The annual snowfall averages about 24 inches, but it ranges from as little as 4 inches to almost 70 inches. The eastern and northern parts of the county normally receive 2 to 4 inches more snow than the Gettysburg area, and the western parts, particularly the higher elevations on South Mountain, may receive as much as 16 inches more snow. The ground generally remains covered with snow for about one-third of the winter, though in some years the ground is covered 60 percent of the winter.

Storms

Thunderstorms, the most frequent type of storm in the county, occur on about 35 days a year, about 8 of them occurring in July. Hail sometimes accompanies these storms, but it seldom causes extensive damage. Moderate to strong winds are fairly common in thunderstorms. Gusts of 50 to 60 miles per hour have been recorded. Remnants of hurricanes and coastal storms occasionally pass near enough for rain to be heavy, but the accompanying winds are seldom damaging.

Organization, Population, and Schools

Adams County was created by an act of Congress on January 22, 1800, from a part of York County. It was named after John Adams, then President of the United States. The area was opened to settlement in 1734. Many of the first settlers were German and Scotch-Irish. They settled in the fertile areas near the present towns of Hanover, Fairfield, and York Springs. Later, settlers came from other States and directly from England, France, Germany, and Scotland. In 1764 two English surveyors established a boundary line between the area granted to the Penns and that granted to Lord Baltimore. This boundary is the Mason-Dixon line, which separates Pennsylvania from Maryland, and it is the southern boundary of Adams County.

Adams County is divided into 20 township and 13 boroughs, and each has formed its own government. Gettysburg, the county seat, is in the south-central part of the county and is surrounded by the Gettysburg National Military Park, a famous Civil War battlefield.

The population of the county was 13,172 in 1800, and in 1960 it was 51,906. The population of Gettysburg was 7,960 in 1960.

In 1963 Adams County had more than 12,000 elementary and high school students and about 600 teachers. The two schools of higher learning, Gettysburg College and the Lutheran Theological Seminary, have more than 1,800 students.

Industry, Markets, and Transportation

Industry and business are rapidly growing in Adams County. In 1959, the products of all industry were valued at $40,800,000. Of this amount, food processing accounted for 35 percent. Fruit processing is the leading industry in the county. The county is the largest apple-processing center in the world and has five plants of three major processors. Plant expansions indicate that this industry will continue to grow.

Locally produced agricultural products are sold at food stores, at roadside markets, at farmers' markets, and by hucksters. The growing number of tourists increases food sales. Living within an hour's drive of Adams County are 1,500,000 people, 28 percent more than lived in the area 10 years ago. This growth adds to the pressure on existing camping and other recreational facilities. A nearby State park was recently visited by 80,000 people during 90 operating days (*1*); it is not adequate to accommodate all the people desiring to use it.

All the farms in the county have access to main roads that lead to markets. Improved roads cross the county in all directions. U.S. Highway No. 15 leads directly to the Pennsylvania Turnpike near Harrisburg and south to Frederick, Md., where four-lane highways run south to Washington, D.C., and other cities. U.S. Highway No. 30 crosses the county from east to west. An improved highway leads directly to Baltimore, Md. Although railway passenger service is not available in the county, bus lines cross the county and run to principal cities and towns. Railways do haul freight east and west and north to Harrisburg. No commercial airline service was available in 1963.

Agriculture

Although the economy of Adams County is changing, farming remains the most important contributor to the economy and to stability. The county retains a rural atmosphere despite recent urban expansion and industrial development. The number of farms in the county declined from 2,376 in 1954 to 2,055 in 1959. Between 1954 and 1959 the average-sized farm increased from 104 to 115 acres. In 1959 the farmland in the county was 263,931 acres, or slightly more than 70 percent of the total land area.

In the Agriculture Census of 1959, the acreage in farms was as follows:

	Acres
Cropland harvested	125,030
Cropland pastured	15,953
Cropland not harvested and not pastured	20,003
Woodland pastured	5,708
Woodland not pastured	34,308
Other pasture	23,201
Other land (roads, house sites, wasteland, etc.)	12,728
Tree fruits, nuts, and grapes	18,565

The total value of farm products in Adams County has steadily increased from 12½ million dollars in 1948 to 20.3 million dollars in 1958 (*1*). Farm income is not dependent upon a single enterprise. Growing fruit and raising livestock and poultry are the leading farm enterprises in terms of total cash receipts. About 90 percent of the cash received from farm products was from the sale of livestock, milk, poultry and eggs, apples, peaches, tart cherries, and tomatoes. Of the 67 counties in Pennsylvania, the Pennsylvania Crop Reporting Service reports that in 1958 Adams County ranked first in the State in cash received from the sale of fruit, fifth in the sale of livestock and livestock products, seventh in the sale of poultry and poultry products, and twenty-sixth in the sale of dairy products. The county was sixth in cash received from the sale of all crops.

According to the Agriculture Census of 1959, the principal crops produced in Adams County were as follows:

		Quantity
Apples (commercial use)	bushels	3,877,755
Peaches	do	553,896
Cherries (sour)	pounds	12,507,779
Cherries (sweet)	do	354,565
Corn for grain	bushels	1,899,899
Corn for silage	tons	27,397
Wheat	bushels	360,649
Oats	do	243,700
Barley	do	126,623
Potatoes (Irish)	do	44,909
Alfalfa and alfalfa mixtures cut for hay	tons	14,600
Clover, timothy, and mixtures of clover and grasses cut for hay	do	43,009

Adams County has some of the better agricultural soils of the State, but it also has some soils that are not suitable for agriculture. About 45,000 acres of farmland needs some kind and amount of drainage. About 17,000 acres, or 10 percent of the land once used for crops, is no longer suited to agriculture because of drainage problems, and 13,000 acres that was once productive is now severely eroded (*13*).

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Glossary

Accelerated erosion. Erosion of the soil over and above normal or natural erosion. It generally results from the activities of man or animals.

Aeration, soil. The process by which air and other gases in the soil are renewed. The rate of soil aeration depends largely on the size and number of pores in the soil and on the amount of water clogging the pores.

Aggregate, soil. Many fine soil particles held in a single mass, or cluster, such as a clod, crumb, block or prism.

Alluvial soil. Soil formed from material, such as gravel, sand, silt, or clay, deposited by a stream and showing little or no modification of the original material by soil-forming processes.

Available moisture capacity. The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity and the amount in the same soil at permanent wilting point. Commonly expressed as inches of water per inch depth of soil.

Base saturation. The degree to which a material is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation exchange capacity.

Bedding. Plowing and grading a field so that parallel beds are raised and are separated by shallow surface drains.

Channery soil. A soil that contains thin, flat fragments of sandstone, limestone, or schist as much as 6 inches in length along the longer axis. A single piece is called a fragment.

Claypan. A compact layer, or horizon, rich in clay and separated more or less abruptly from the overlying horizon.

Colluvial soil. Soil formed from material that has been moved by gravity, creep, frost action, or local wash and deposited on lower slopes and at the base of slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; soil does not hold together in a mass.

Friable. -When moist, soil crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, soil crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, soil is readily deformed by moderate pressure but can be pressed into a lump; forms a wire when rolled between thumb and forefinger.

Sticky.—When wet, soil adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, soil is moderately resistant to pressure and is difficult to break between the thumb and forefinger.

Soft.—When dry, soil breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Cover crop. A close-growing crop grown primarily to improve the soil and to protect it between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Diversion terrace. A channel that has a supporting ridge on the lower side. It is constructed across the slope to intercept runoff and to carry runoff to a planned outlet. These channels, or terraces, are kept in permanent sod.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A dense and brittle pan, or layer, in soils that owes its hardness mainly to extreme density or compactness rather

than to cementation or to a high content of clay. Fragments that are removed are friable, but the material in place is so dense that roots cannot penetrate and water moves through it very slowly because of the small size of the pores. A fragipan is indicated by the letter *x* in the description of the profile.

Graded stripcropping. Growing crops in strips that are graded toward a protected waterway.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes and that differs in one or more ways from adjacent horizons in the same profile. Soil horizons designated by capital letters are defined as follows:

A horizon.—The mineral horizon at the surface. It contains an accumulation of organic matter, has been leached of soluble minerals and clay, or shows the effects of both.

B horizon.—The horizon in which clay minerals or other material have accumulated, or that has developed a characteristic blocky or prismatic structure, or that shows the effects of both processes.

C horizon.—The unconsolidated material immediately under the true soil. In chemical, physical, and mineral composition it is presumed to be similar to the material from which at least part of the overlying solum has developed, unless the C designation is preceded by a Roman numeral.

R horizon.—Rock underlying the C horizon, or the B horizon if no C horizon is present.

Roman numerals are prefixed the master horizon or layer designation (A, B, C, R) to indicate lithologic discontinuities either within or below the solum. The first, or uppermost, material is not numbered, for the Roman numeral I is understood; the second, or contrasting, material is numbered II, and others are numbered III, IV, and so on, consecutively downward. Thus, for example, a sequence from the surface downward might be A1, B1, B2, C, IIC2.

Following are the small-letter symbols that may be a part of a horizon designation (B21g), and the meaning of these symbols.

g—strong gleying.
h—illuvial humus.
p—plow layer.
t—illuvial clay.
x—fragipan.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Mottled. Irregularly marked with spots of different color that vary in number and size. Descriptive terms are as follows: Abundance—*few, common, and many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (0.6 inch) in diameter along the greatest dimension.

Parent material. The weathered rock or partly weathered soil material from which a soil has formed; the C horizon in the soil profile.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.*

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Phyllite. A micaceous schist, intermediate between mica-schist and slate.

Reaction, soil. The degree of acidity or alkalinity of the soil, expressed in pH values or in words, as follows:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medim acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Residual soil. Soil formed in place from mineral material weathered from the underlying rock. Presumably developed from the same kind of rock as that on which it lies.

Series, soil. A group of soils developed from a particular kind of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Soil association. A group of soils, with or without common characteristics, that are geographically associated in a repeating pattern.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in a mature soil includes the A and B horizons.

Stripcropping. The growing of crops in a systematic arrangement of strips or bands that serve as vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *angular blocky* (prisms with sharp corners), *subangular blocky* (prisms with mostly rounded corners), *granular* (granules relatively nonporous), *crumb* (similar to granular but very porous). *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering without any regular cleavage, as in many claypans and hardpans).

Subsoil. In many soils, the B horizon; commonly that part of the profile below plow depth.

Subsurface soil. That part of the A horizon below the surface soil.

Substratum. Any layer lying beneath the solum or B horizon; the C or R horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour.

Texture. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical properties of the soil that affect the ease of cultivating it or its suitability for crops (implies the presence or absence of favorable soil structure).

Topsoil. Presumably fertile soil or soil material, ordinarily rich in organic matter, that is used to topdress roadbanks, gardens, parks, and lawns.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

[See table 8, p. 80, for the approximate acreage and proportionate extent of the soils, table 1, p. 20, for the estimated productivity ratings of soils for specified crops, and table 2, p. 28, for the potential productivity, suitable trees, and hazards of woodland suitability groups. For information about engineering, see the subsection "Engineering Uses of the Soils"]

Map symbol	Soil	Described on page	Capability unit		Building group	
			Symbol	Page	Number	Page
AbA	Abbottstown silt loam, 0 to 3 percent slopes	82	IIIw-1	11	12	79
AbA2	Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded	82	IIIw-1	11	12	79
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded	82	IIIw-1	11	12	79
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes	82	I-1	8	1	62
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded	82	IIe-2	8	1	62
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded	83	IIIe-2	10	2	62
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded	83	IVe-1	12	2	62
AgD	Arendtsville gravelly loam, 15 to 25 percent slopes	83	IVe-1	12	2	62
AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded	83	VIe-3	14	2	62
AgE	Arendtsville gravelly loam, 25 to 35 percent slopes	83	VIe-3	14	9	78
AgE3	Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded	83	VIIe-1	15	9	78
AgF2	Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded	83	VIIe-1	15	9	78
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded	84	IIe-1	8	1	62
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded	84	IIe-1	8	1	62
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded	84	IIIe-1	10	2	62
Be	Bermudian silt loam	84	I-2	8	13	79
BmA	Birdsboro silt loam, 0 to 3 percent slopes	85	I-1	8	1	62
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded	85	IIe-1	8	1	62
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded	85	IIIe-1	10	2	62
Bn	Bowmansville silt loam	86	IIIw-3	12	13	79
BoA	Bowmansville silt loam, local alluvium, 0 to 3 percent slopes	86	IIIw-1	11	13	79
BoB	Bowmansville silt loam, local alluvium, 3 to 8 percent slopes	86	IIIw-1	11	13	79
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded	86	IIe-3	9	5	63
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded	87	IIe-3	9	5	63
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded	87	IIIe-3	10	5	63
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded	87	IIIe-3	10	6	63
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded	87	IVe-2	12	6	63
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded	87	IVe-2	12	6	63
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded	87	VIe-2	14	6	63
BrE	Brecknock silt loam, 25 to 50 percent slopes	87	VIIe-1	15	9	78
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes	88	IIw-1	9	10	78
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes	88	IIe-5	9	10	78
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes	88	VIs-2	15	10	78
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded	88	IIe-3	9	7	63

GUIDE TO MAPPING UNITS--Continued

Map symbol	Soil	Described on page	Capability unit		Building site group	
			Symbol	Page	Number	Page
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded	88	IIIe-3	10	8	78
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded	88	IVe-2	12	8	78
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded	89	IVe-2	12	8	78
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded	89	VIe-2	14	8	78
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded	89	VIIe-1	15	9	78
Ck	Chewacla silt loam	89	IIw-2	10	13	79
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded	90	IIe-14	8	1	62
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded	90	IIe-1	8	1	62
CoB3	Conestoga silt loam, 3 to 8 percent slopes, severely eroded	90	IIIe-1	10	1	62
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded	90	IIIe-1	10	2	62
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded	90	IVe-1	12	2	62
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded	90	VIe-1	14	2	62
CrA	Croton silt loam, 0 to 3 percent slopes	91	IVw-1	13	12	79
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded	91	IVw-2	13	12	79
Du	Dunning silty clay loam	92	IVw-1	13	13	79
EcB	Edgemont channery loam, 3 to 8 percent slopes	92	IIe-2	8	1	62
EcC	Edgemont channery loam, 8 to 15 percent slopes	92	IIIe-2	10	2	62
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded	92	IVe-1	12	2	62
EhB	Edgemont very stony loam, 0 to 8 percent slopes	93	VIs-1	14	5	63
EhD	Edgemont very stony loam, 8 to 25 percent slopes	93	VIs-1	14	6	63
EhE	Edgemont very stony loam, 25 to 70 percent slopes	93	VIIs-1	15	9	78
GcA	Glenelg silt loam, 0 to 3 percent slopes	93	I-1	8	5	63
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded	93	IIe-2	8	5	63
GcC	Glenelg silt loam, 8 to 15 percent slopes	94	IIIe-2	10	6	63
GcC2	Glenelg silt loam, 8 to 15 percent slopes, moderately eroded	94	IIIe-2	10	6	63
GnA	Glenville silt loam, 0 to 3 percent slopes	94	IIw-1	9	10	78
GnB	Glenville silt loam, 3 to 8 percent slopes	94	IIe-5	9	10	78
Gu	Guthrie silt loam	95	IVw-1	13	12	79
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded	95	IIe-2	8	1	62
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded	95	IIe-2	8	1	62
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded	96	IIIe-2	10	2	62
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded	96	IVe-1	12	2	62
HcD	Highfield channery silt loam, 15 to 25 percent slopes	96	IVe-1	12	2	62
HcD3	Highfield channery silt loam, 15 to 25 percent slopes, severely eroded	96	VIe-3	14	2	62
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes	96	VIs-1	14	5	63
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes	96	VIs-1	14	6	63
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes	96	VIIs-1	15	9	78

Map symbol	Soil	Described on page	Capability unit		Building site group	
			Symbol	Page	Number	Page
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded	97	IIe-4	9	7	63
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded	97	IVe-3	12	8	78
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded	97	VIe-1	14	8	78
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded	97	IIIe-4	11	7	63
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded	98	IIIe-4	11	7	63
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded	98	IVe-2	12	7	63
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded	98	IVe-2	12	8	78
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded	98	VIe-2	14	8	78
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded	98	VIIe-1	15	8	78
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded	98	VIIe-1	15	9	78
La	Lamington silt loam	99	IVw-1	13	12	79
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded	99	IIe-3	9	5	63
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded	99	IIe-3	9	5	63
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded	99	IIIe-3	10	5	63
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded	100	IIIe-3	10	6	63
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded	100	IVe-2	12	6	63
Le	Lawrence silt loam	100	IIIw-1	11	12	79
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded	101	IIe-4	9	7	63
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded	101	IIIe-3	10	8	78
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded	101	IVe-3	12	8	78
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded	101	VIe-1	14	8	78
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded	101	VIIe-1	15	9	78
LhA	Lehigh silt loam, 0 to 3 percent slopes	102	IIIw-1	11	10	78
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded	102	IIIw-1	11	10	78
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded	102	IVe-4	13	12	79
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded	103	VIe-4	14	12	79
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes	103	VIs-2	15	10	78
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded	103	IIe-3	9	5	63
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded	104	IIIe-3	10	6	63
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded	104	IVe-2	12	6	63
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded	104	VIe-2	14	6	63
Me	Melvin and Lindside silt loams	104				
	Melvin soil		IIIw-3	12	13	79
	Lindside soil		IIw-2	10	13	79
MoA	Montalto silt loam, 0 to 3 percent slopes	105	I-1	8	3	63
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded	105	IIe-1	8	3	63
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded	105	IIIe-1	10	4	63
MsB	Montalto very stony silt loam, 0 to 8 percent slopes	105	VIs-1	14	3	63
MsD	Montalto very stony silt loam, 8 to 25 percent slopes	106	VIs-1	14	4	63

GUIDE TO MAPPING UNITS--Continued

Map symbol	Soil	Described on page	Capability unit		Building site group	
			Symbol	Page	Number	Page
MsE	Montalto very stony silt loam, 25 to 50 percent slopes----	106	VIIs-1	15	9	78
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded----------	106	IIe-5	9	10	78
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded----------	106	IIe-5	9	10	78
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded----------	106	IIIe-5	11	11	78
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes----------	107	IIIw-1	11	12	79
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes----------	107	IIIw-1	11	12	79
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded----------	107	IIe-2	8	1	62
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded----------	107	IIe-2	8	1	62
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded----------	107	IIIe-2	10	2	62
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded----------	108	IVe-1	12	2	62
MvD	Myersville silt loam, 15 to 25 percent slopes----------	108	IVe-1	12	2	62
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded----------	108	VIe-3	14	2	62
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded--	108	IIe-3	9	5	63
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded--	109	IIe-3	9	5	63
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded----	109	IIIe-3	10	5	63
PeC2	Penn silt loam, 8 to 15 percent slopes, moderately eroded-	109	IIIe-3	10	6	63
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded---	109	IVe-2	12	6	63
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded----------	109	IVe-2	12	6	63
RaA	Readington silt loam, 0 to 3 percent slopes----------	110	IIw-1	9	10	78
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded----------	110	IIe-5	9	10	78
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes----------	110	IIw-1	9	10	78
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded----------	110	IIe-5	9	10	78
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded----------	111	IIIw-2	11	12	79
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded----------	111	IIIw-2	11	12	79
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded----------	111	IVe-4	13	12	79
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded----------	111	IVe-4	13	12	79
RhA	Rohrersville silt loam, 0 to 3 percent slopes----------	112	IIIw-1	11	12	79
RhB	Rohrersville silt loam, 3 to 8 percent slopes----------	112	IIIw-1	11	12	79
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes----------	112	VIIs-2	15	12	79
Ro	Rowland silt loam----------	112	IIw-2	10	13	79
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded----------	113	IIIe-4	11	7	63
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded----------	113	IVe-2	12	7	63
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded----------	113	IVe-2	12	8	78
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded----------	113	VIe-2	14	8	78
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded----------	113	VIIe-1	15	8	78

GUIDE TO MAPPING UNITS--Continued

Map symbol	Soil	Described on page	Capability unit		Building site group	
			Symbol	Page	Number	Page
WaA	Watchung silt loam, 0 to 3 percent slopes	114	Vw-1	13	12	79
WaB	Watchung silt loam, 3 to 8 percent slopes	114	VIw-1	14	12	79
WcA	Watchung very stony silt loam, 0 to 8 percent slopes	114	VIIs-2	15	12	79
Wd	Wehadkee silt loam	114	IIIw-3	12	13	79
WoA	Worsham silt loam, 0 to 3 percent slopes	115	Vw-1	13	12	79
WoB	Worsham silt loam, 3 to 8 percent slopes	115	VIw-1	14	12	79

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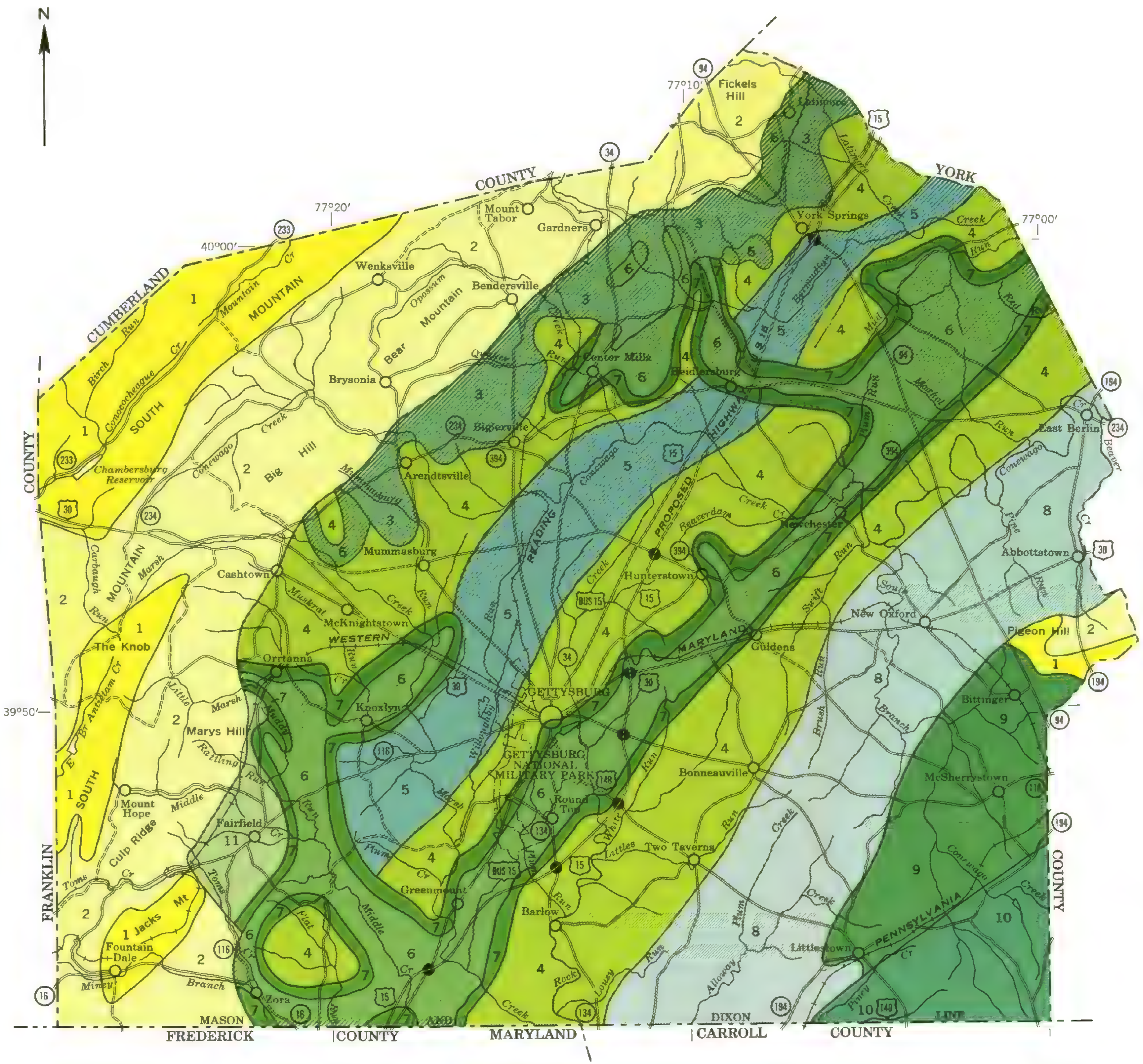
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
PENNSYLVANIA STATE UNIVERSITY,
COLLEGE OF AGRICULTURE AND AGRICULTURAL EXPERIMENT STATION,
AND THE PENNSYLVANIA DEPARTMENT OF AGRICULTURE
STATE SOIL AND WATER CONSERVATION COMMISSION

GENERAL SOIL MAP
ADAMS COUNTY, PENNSYLVANIA

Scale 1:190,080

1 0 1 2 3 4 Miles



SOIL ASSOCIATIONS

1 Edgemont-Highfield association: Steep, well-drained stony soils on ridges

2 Highfield-Myersville-Catoctin association: Hilly, well-drained, channery and stony soils on ridges

3 Arendtsville-Highfield association: Dominantly rolling, well-drained gravelly soils that have slopes ranging from gentle to steep

4 Penn-Readington-Croton association: Gently sloping to moderately sloping, shallow to moderately deep shaly soils

5 Klinesville-Penn-Abbottstown-Croton association: Gently sloping to moderately sloping, mostly shallow shaly soils that are well drained to poorly drained

6 Montalto-Mount Lucas-Watchung association: Rolling to gently sloping, medium acid soils

7 Lehigh-Brecknock association: Gently sloping to moderately steep, moderately deep soils

8 Penn-Lansdale-Abbottstown association: Gently sloping to moderately sloping, strongly acid soils that are mostly well drained or somewhat droughty

9 Conestoga-Wiltshire-Lawrence association: Mostly deep, gently sloping, medium acid and slightly acid soils

10 Glenelg-Manor-Glenville association: Shallow to moderately deep, mostly well-drained soils on gently sloping to moderately steep slopes

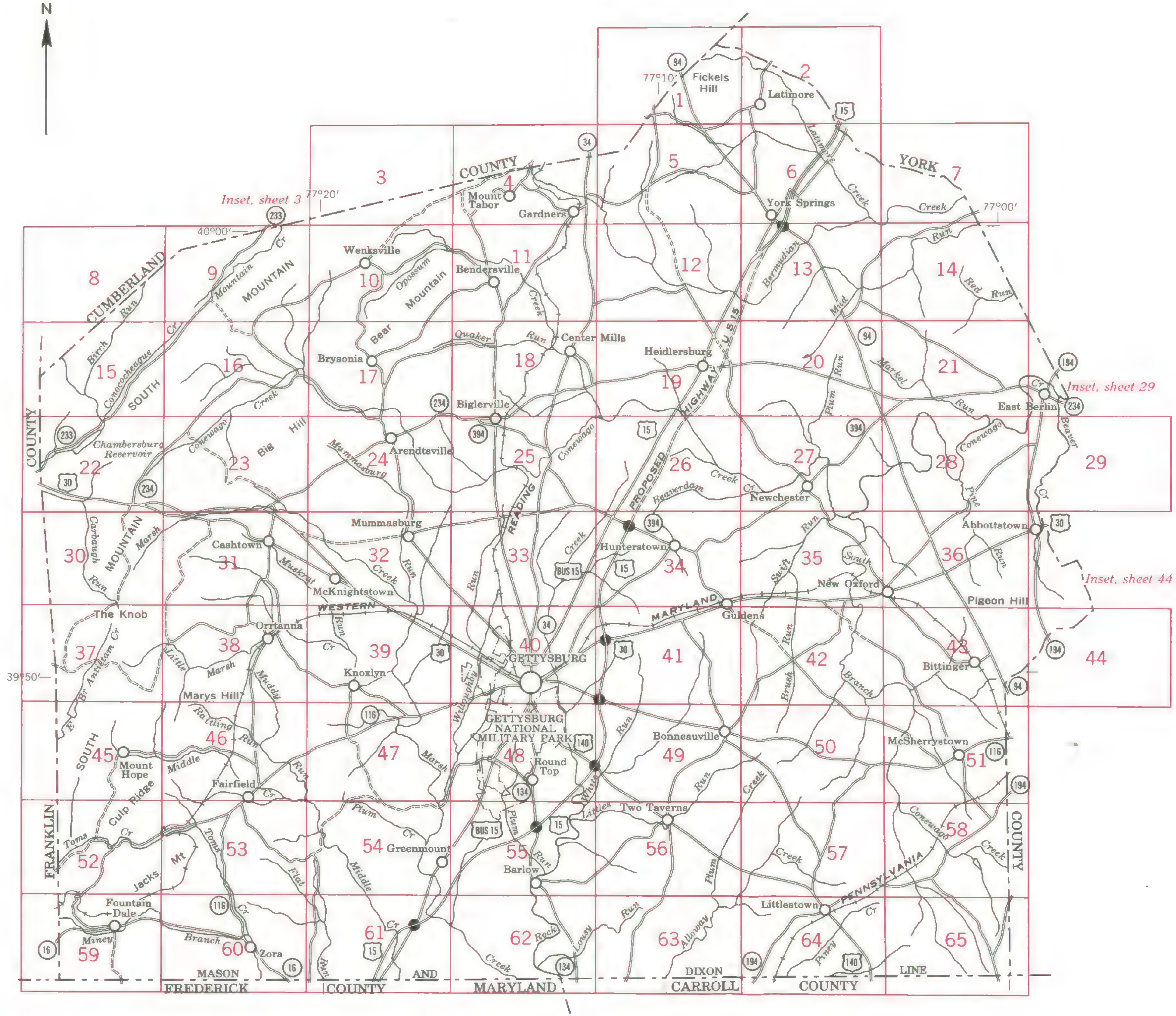
11 Athol-Wiltshire-Readington association: Deep, gently sloping, medium acid and slightly acid soils that are intensively farmed

September 1966

INDEX TO MAP SHEETS
ADAMS COUNTY, PENNSYLVANIA

Scale 1:190,080

1 0 1 2 3 4 Miles



ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 1

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

(10)

(Joins sheet 3)

N

PINEY MOUNTAIN

Wenksville

M E N A L L E N

Opossum Creek

B E A R M O U N T A I N

(Joins sheet 9)

(Joins sheet 11)

(Joins sheet 17)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 4)

11

N

Big Hill

Round Top

Opossum Creek

M E N A L L E N

Rampike Hill

Bendersville

Rattlesnake Hill

READING

T Y R O N E

Wolfpit Hill

Aspers

B U T L E R

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 18)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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(12)

(Joins sheet 5)

N

Upper Bermudian Church

H U N T I N G T O N

Bermudian

Creek

Goodintent Mills

T Y R O N E

Valley

Cranberry

Rock Chapel School

(Joins sheet 11)

(Joins sheet 13)

(Joins sheet 19)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 6)

13

N

L A T I M O R E

H U N T I N G T O N

R E A D I N G

BERMUDIAN CREEK

BERMUDIAN CR

Gardner Run

York Sulphur Springs

Bermudian Springs School

Bermudian Creek

Mud Run

U.S. HIGHWAY 15

PROPOSED

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 20)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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14

N

(Joins sheet 7)

(Joins sheet 13)

L A T I M O R E

R E A D I N G

Two Churches School

Mud

Run

Pond

YORK COUNTY

(Joins sheet 21)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 8)

15

N

Sier Hill

Strasbaugh Hill

BOY SCOUT CAMP

Rocky Knob

Knob

Run

Run

Mitten Hill

CUMBERLAND COUNTY

Green Ridge

Long

Wolf Hill

Pine

Birch

Run

Wigwam Hill

Run

FRANKLIN COUNTY

Yellow Ridge

Creek

Conococheague

233

233

MOUNTAIN

FRANKLIN

BIG FLAT RIDGE

SOUTHEAST

PINEY MOUNTAIN

(Joins sheet 16)

(Joins sheet 22)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1956 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

16

(Joins sheet 9)

N

SOUTH MOUNTAIN

M E N A L L E N

F R A N K L I N

B U C H A N A N

VALLEY

Conocoheague Creek

Toms Creek

Middle Creek

Centenago Creek

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 23)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 10)

(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 24)

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

CAMP NAWAKWA

BEAR MOUNTAIN

Wildcat Knob

Brysonia

Quaker Run

Run

Yellow Hill

MENALLEN

Dale

Pleasant

The Narrows

Eicholtz Mill

Conewago Creek

Bridgeport

FRANKLIN

BUTLER

234

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

18

(Joins sheet 11)

N

M E N A L L E N

Tysons Hill

Flora Dale

Quaker Valley Run

Quaker Run

Center Mills Station

Center Mills

READING

Opossum Creek

Guernsey

B U T L E R

READING

Biglerville

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 25)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 12)

19

N

Cranberry Valley

Chestnut Hill

HUNTINGTON

Heidlersburg

TYRONE

BUTLER

CONEWAGO CREEK

HIGHWAY PROPOSED

STRABAN

(Joins sheet 18)

(Joins sheet 20)

(Joins sheet 26)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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2

N

(Joins sheet 1)

(Joins sheet 6)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

20

N

(Joins sheet 13)

(Joins sheet 19)

(Joins sheet 21)

(Joins sheet 27)

0 ½ 1 Mile

Scale 1:15840

0 WaB 5000 Feet

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 21

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

(22)

(Joins sheet 15)

N

Yellow Ridge

Wildcat Hill

Birch Run

Conococheague

Stillhouse Run

Chambersburg Reservoir

FRANKLIN COUNTY

Graefenburg Hill

F R A N K L I N

M O U N T A I N

P I N E

S O U T H

Tarbaugh Run

Clear Run

Conococheague Creek

(Joins sheet 23)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 30)

(Joins sheet 16)

N

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 31)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

(24)

(Joins sheet 17)

N

Bushy Hill

Arendtsville

Conewago Creek

B U T L E R

Beechersville

F R A N K L I N

Mummasburg Run

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 32)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 18)

N

Biglerville

SEWAGE DISPOSAL

B U T L E R

Table Rock

S T R A B A N

Conewago Creek

READING

Conewago Creek

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 33)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture. State Soil and Water Conservation Commission.

(Joins sheet 19)

N

BUTLER

TYRONE

STRABAN

Opossum Creek

Conewago Creek

Stone Jug Hill

Plainview

CONEWAGO CREEK

HIGHWAY

PROPOSED

Beaverdam

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 34)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 20)

27

N

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 35)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 28

28

(Joins sheet 21)

N

Hafers Mills

BROWNS DAM

Market

Run

CREEK

R E A D I N G

R E A D I N G

CREEK

CONEWAGO

CONEWAGO

Mummerts Church

H A M I L T O N

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 36)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

N

N

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture and State Soil and Water Conservation Commission.

30

N

(Joins sheet 22)

RhB

Mount Newman

F R A N K L I N

S N A G G Y R I D G E

FRANKLIN COUNTY

Carbaugh Run

M O U N T A I N

S O U T H M O U N T A I N

Marsh Creek Hollow

G R E E N R I D G E

Carbaugh Run

H A M I L T O N B A N

(Joins sheet 31)

(Joins sheet 37)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 23)

31

N

(Joins sheet 30)

(Joins sheet 32)

Creek

Marsh

Hilltown

Rock Top

Cashtown

F R A N K L I N

FLOHRS CEMETERY

Run

(Joins sheet 38)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture and State Soil and Water Conservation Commission.

(32)

(Joins sheet 24)

N

Fox Hill

Marsh

Creek

F R A N K L I N

Mummasburg

Mummasburg

B U T L E R

McKnightstown

Marsh

Creek

Run

CUMBERLAND

(Joins sheet 31)

(Joins sheet 33)

(Joins sheet 39)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 33

(Joins sheet 25)

33

N

Goldenville

B U T L E R

S T R A B A N

C U M B E R L A N D

FRANKLIN

READING

Willoughby

Rock Creek

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 40)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

34

(Joins sheet 26)

N

PROPOSED

Hunterstown

S T R A B A N

Guldens

MARYLAND

WESTERN

(Joins sheet 33)

(Joins sheet 35)

(Joins sheet 41)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 27)

35

N

STRABAN

READING

HAMILTON

MOUNT PLEASANT

OXFORD

The Pines

CONEWAGO CREEK

Rock Run

South Branch Conewago Creek

Conewago Creek

Brush Run

Brush Run

MARYLAND WESTERN RAILROAD

New Oxford

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 42)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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(Joins sheet 28)

(Joins sheet 35)

(Joins inset, sheet 44)

(Joins sheet 43)

H A M I L T O N

B E R W I C K

O X F O R D

Abbottstown

New Oxford

Cross Keys

Pigeon Hill

WESTERN MARYLAND

LIMESTONE

Scale 1:15840

0 ½ 1 Mile

0 5000 Feet

(Joins sheet 30)

37

N

FRANKLIN COUNTY

FRANKLIN

HAMILTON BAN

MOUNTAIN

RIDGE

SOUTH GREEN

The Knob

Run

Run

(Joins sheet 38)

(Joins sheet 45)

0 ½ 1 Mile

Scale 1:15840

0 5000

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

38

(Joins sheet 31)

N

F R A N K L I N

H I G H L A N D

H A M I L T O N B A N

Mt Carmel Church

Chamberlains Hill

Marys Hill

Marys Rock

Orrtanna

Poplar Spring Creek

Little Marsh Creek

Little Marsh Creek

Marsh Creek

Muddy Run

MARYLAND

WESTERN

(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 46)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 32)

(Joins sheet 38)

(Joins sheet 40)

(Joins sheet 47)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.


4
N
CUMBERLAND COUNTY
Peach Glen
H U N T I N G T O N
Bermudian
READING
Creek
Idaville
Mount Tabor
T Y R O N E
M E N A L L E N
Big Hill
Gardners
34
30
(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 11)
0
½
1 Mile
Scale 1:15840
0
5000 Feet

40

(Joins sheet 33)

N

(Joins sheet 39)

(Joins sheet 41)

(Joins sheet 48)

C U M B E R L A N D

S T R A B A N

Oak Ridge

Herr Ridge

Willoughby Run

READING

GETTYSBURG NATIONAL MILITARY PARK

MARYLAND

WESTERN

Barlow Knoll

Zinkland Pond

GETTYSBURG COLLEGE

GETTYSBURG NAT MIL PARK

GOLF COURSE

Rock Creek

GETTYSBURG NATIONAL MILITARY PARK

McPherson Ridge

Seminary Ridge

Stevens

Benner Hill

0 1 Mile

Scale 1:15840

0 5000 Feet

42

N

(Joins sheet 35)

(Joins sheet 41)

(Joins sheet 43)

(Joins sheet 50)

Cedar Ridge

Swift Run

Bush Run

CONEWAGO CREEK

BRANCH

OXFORD

MOUNT PLEASANT

HILLS

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 36)

N

Berlin Junction

LIMESTONE QUARRY

B E R W I C K

Green Springs

O X F O R D

WESTERN MARYLAND

LIMESTONE QUARRY

Mount Misery

Irishtown

Bittinger

MADE LAND

YORK COUNTY

SOUTH BRANCH CONEWAGO CR.

M O U N T P L E A S A N T

C O N E W A G O

(Joins sheet 42)

(Joins sheet 51)

(Joins sheet 44)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture and the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

N

(Joins lower right)

B E R W I C K

Pigeon Hills

YORK COUNTY

(Joins sheet 43)

RdB2

(Sh 29)

AbA

PeB2

Berry

Abbottstown

RaB2

KsD3

KsC2

RaB2

MT OLIVE CEMETERY

PeB2

RaB

KsC2

YORK COUNTY

(Joins sheet 36)

Lillich Valley

B E R W I C K

HcD

HcC2

RhB

EhB

(Joins upper left)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 37)

N

WAYNESBORO DAM

Rum Creek

Antrim

East Branch

FRANKLIN COUNTY

HAMILTON BAN MOUNTAIN

GREEN RIDGE SOUTH MOUNTAIN

Mount Hope

Middle Creek

Swamp

Cutlip Ridge

(Joins sheet 46)

(Joins sheet 52)

0 1 Mile

Scale 1:15840

0 5000 Feet

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(46)

(Joins sheet 38)

N

Rupp Hill

Bakers Knob

H A M I L T O N B A N

Sugarloaf

HIGHLAND

Rattling Run

Muddy Run

MARYLAND

WESTERN RN

Middle Creek

Virginia Mills

Fairfield Station

Fairfield

Spring Run

Muddy Run

Middle Cr

(Joins sheet 45)

(Joins sheet 47)

(Joins sheet 53)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 39)

(Joins sheet 46)

(Joins sheet 48)

(Joins sheet 54)

N

Black Horse Tavern

MARSH

CREEK

Rock Run

W. Houghton

C U M B E R L A N D

H I G H L A N D

F R E E D O M

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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48

(Joins sheet 40)

N

Cemetery Hill

Culps Hill

S T R A B A N

Wolf Hill

Spanglers Spring

Sheep Heaven

ROCK

Powers Hill

C U M B E R L A N D

Round Top

Little Round Top

QUARRY

CREEK

(Joins sheet 47)

(Joins sheet 49)

(Joins sheet 55)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 5

5

N

(Joins sheet 1)

CUMBERLAND COUNTY

L A T I M O R E

Snyders Hill

H U N T I N G T O N

Gargol

T Y R O N E

Bermudian Cr

(Joins sheet 4)

(Joins sheet 6)

(Joins sheet 12)

1 Mile 0 ½

Scale 1:15840

5000 Feet 0

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N

(Joins sheet 42)

(Joins sheet 49)

(Joins sheet 51)

(Joins sheet 57)

Square Corner

Centennial

Whitehall

M O U N T P L E A S A N T

U N I O N

Run

Brush

116

0 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 43)

(Joins sheet 50)

(Joins sheet 58)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

MOUNT PLEASANT

UNION

CONEWAGO

Conewago Chapel

Edgegrove

Centennial

McSherrystown

Midway

Brushtown

St Joseph Academy

Conewago Creek

South Branch

Plum Creek

WESTERN MARYLAND

PENNSYLVANIA

ADAMS COUNTY

YORK

N

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

52

N

(Joins sheet 45)

HcC2 HhE HcD3

Kepner Knob

H A M I L T O N B A N

M O U N T A I N

C u l p R i d g e

FRANKLIN COUNTY

Toms Creek

S O U T H M O U N T A I N

Pine Mountain

Greenstone

Jacks Mountain

HhE

(Joins sheet 53)

(Joins sheet 59)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 46)

N

Fairfield

Spring Run

Middle Creek

HAMILTON BAN

MARYLAND

WESTERN

McGinley Hill

Iron Springs

Maria Furnace

Toms Creek

Jacks Mountain

MARYLAND

WESTERN

LIBERTY

McKee Hill

Flat Run

116

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 52)

(Joins sheet 54)

(Joins sheet 60)

(54)

(Joins sheet 47)

N

(Joins sheet 53)

(Joins sheet 55)

(Joins sheet 61)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture, State Soil and Water Conservation Commission

(Joins sheet 48)

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 62)

GETTYSBURG NATIONAL MILITARY PARK

Round Top

C U M B E R L A N D

M O U N T

J O Y

Barlow

Rock Creek

Willoughby Run

Latimore Creek

Scale 1:15840

0 ½ 1 Mile

0 5000 Feet

N

56

(Joins sheet 49)

N

Two Taverns

Germantown

M O U N T J O Y

(Joins sheet 55)

(Joins sheet 57)

(Joins sheet 63)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 57

57

(Joins sheet 50)

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 64)

N

MOUNT PLEASANT

MOUNT JOY

UNION

GERMANY

Pleasant Hill

Alloway Creek

QUARRY

PENNSYLVANIA

148

194

140

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

58

N

(Joins sheet 51)

(Joins sheet 57)

(Joins sheet 65)

C O N E W A G O

U N I O N

Mount Pleasant

Hunter Reservoir

RACECOURSE

Sells Station

Strouble Branch

Conewago Creek

Indian Run

PENNSYLVANIA

YORK COUNTY

194

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 52)

59

N

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

Gladhill

Tunnel Hill

ROCK QUARRY

WESTERN MARYLAND

MARYLAND

WESTERN

H A M I L T O N B A N

JACKS MOUNTAIN TUNNEL

Branch

Fountain Dale

Miney

WESLEY CHAPEL CEMETERY

Raven Rock Mountain

FRANKLIN COUNTY

Haycock

S O U T H

L I B E R T Y

MASON AND DIXON LINE

FREDERICK COUNTY MARYLAND

(Joins sheet 60)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 6

6

N

(Joins sheet 2)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 13)

Gardners Church

Boners Hill

SUNNY SIDE CEMETERY

L A T I M O R E

Latimore Church

YORK COUNTY

Deardorffs Mill

Latimore Creek

HUNTINGTON

York Springs

BERMUDIAN CR

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 53)

60

N

HAMILTONBAN

L I B E R T Y

Miney Branch

Cove Hollow

Zora

Shanks Mill

Creek

Creek

Friends

MASON AND DIXON LINE

FREDERICK COUNTY MARYLAND

(Joins sheet 59)

(Joins sheet 61)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

ADAMS COUNTY, PENNSYLVANIA — SHEET NUMBER 61

(Joins sheet 54)

61

N

LIBERTY

FREEDOM

CUMBERLAND

Fairplay

Middle Creek

Marsh Creek

Pitcl

Br Run

MASON AND DIXON LINE

FREDERICK COUNTY MARYLAND

(Joins sheet 60)

(Joins sheet 62)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission

(Joins sheet 55)

N

(Joins sheet 61)

(Joins sheet 63)

CUMBERLAND

FREEDOM

MOUNTJOY

Harpers Hill

Mt Joy Church

MARSH CREEK

ROCK RUN

LOUSE RUN

MASON AND DIXON LINE

MARYLAND

FREDERICK COUNTY

CARROLL COUNTY

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 56)

HOFFMAN ORPHANAGE

M O U N T J O Y

G E R M A N Y

St James Church

Plum Creek

Conewago Creek

Altoona

MASON AND DIXON LINE

CARROLL COUNTY MARYLAND

(Joins sheet 62)

(Joins sheet 64)

N

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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(Joins sheet 57)

N

Littlestown

U N I O N

PENNSYLVANIA

Slate Ridge

Mount Pleasant

SAINT ALOYSIUS CEMETERY

Oak Grove

G E R M A N Y

Kingsdale

Menges Mill

Georgetown

MASON AND DIXON LINE

CARROLL COUNTY MARYLAND

(Joins sheet 63)

(Joins sheet 65)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 58)

(Joins sheet 64)

U N I O N

G E R M A N Y

YORK COUNTY

MASON AND DIXON LINE

CARROLL COUNTY MARYLAND

N

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

N

(Joins sheet 6)

Bermudian

YORK COUNTY

Mechanicsville School

L A T L M O R E

BERMUDIAN CREEK

(Joins sheet 14)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

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8

N

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins inset, sheet 3)

N

(Joins sheet 8)

(Joins sheet 10)

CUMBERLAND COUNTY

Dead Woman Hollow

Grave Creek

Mountain

Ridge

East Big Flat Ridge

Ram Hill

MENALLEN MOUNTAINS

SOUTH MOUNTAINS

FRANKLIN

(Joins sheet 16)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1966 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, the Pennsylvania State University, College of Agriculture and Agricultural Experiment Station, and the Pennsylvania Department of Agriculture State Soil and Water Conservation Commission.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

ADAMS COUNTY, PENNSYLVANIA

PENNSYLVANIA STATE UNIVERSITY, COLLEGE OF AGRICULTURE AND AGRICULTURAL EXPERIMENT STATION
PENNSYLVANIA DEPARTMENT OF AGRICULTURE, STATE SOIL AND WATER CONSERVATION COMMISSION

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F shows the slope. Most symbols without a slope letter are those of nearly level soils. Soils that are named as moderately eroded or severely eroded have a final number, 2 or 3, in their symbol.

SYMBOL	NAME
AbA	Abbottstown silt loam, 0 to 3 percent slopes
AbA2	Abbottstown silt loam, 0 to 3 percent slopes, moderately eroded
AbB2	Abbottstown silt loam, 3 to 8 percent slopes, moderately eroded
AgA	Arendtsville gravelly loam, 0 to 3 percent slopes
AgB2	Arendtsville gravelly loam, 3 to 8 percent slopes, moderately eroded
AgC2	Arendtsville gravelly loam, 8 to 15 percent slopes, moderately eroded
AgC3	Arendtsville gravelly loam, 8 to 15 percent slopes, severely eroded
AgD	Arendtsville gravelly loam, 15 to 25 percent slopes
AgD3	Arendtsville gravelly loam, 15 to 25 percent slopes, severely eroded
AgE	Arendtsville gravelly loam, 25 to 35 percent slopes
AgE3	Arendtsville gravelly loam, 25 to 35 percent slopes, severely eroded
AgF2	Arendtsville gravelly loam, 35 to 50 percent slopes, moderately eroded
AtA2	Athol gravelly silt loam, 0 to 3 percent slopes, moderately eroded
AtB2	Athol gravelly silt loam, 3 to 8 percent slopes, moderately eroded
AtC2	Athol gravelly silt loam, 8 to 15 percent slopes, moderately eroded
Be	Bermudian silt loam
BmA	Birdsboro silt loam, 0 to 3 percent slopes
BmB2	Birdsboro silt loam, 3 to 8 percent slopes, moderately eroded
BmC2	Birdsboro silt loam, 8 to 15 percent slopes, moderately eroded
Bn	Bowmansville silt loam
BoA	Bowmansville silt loam, local alluvium, 0 to 3 percent slopes
BoB	Bowmansville silt loam, local alluvium, 3 to 8 percent slopes
BrA2	Brecknock silt loam, 0 to 3 percent slopes, moderately eroded
BrB2	Brecknock silt loam, 3 to 8 percent slopes, moderately eroded
BrB3	Brecknock silt loam, 3 to 8 percent slopes, severely eroded
BrC2	Brecknock silt loam, 8 to 15 percent slopes, moderately eroded
BrC3	Brecknock silt loam, 8 to 15 percent slopes, severely eroded
BrD2	Brecknock silt loam, 15 to 25 percent slopes, moderately eroded
BrD3	Brecknock silt loam, 15 to 25 percent slopes, severely eroded
BrE	Brecknock silt loam, 25 to 50 percent slopes
BuA	Buchanan gravelly silt loam, 0 to 3 percent slopes
BuB	Buchanan gravelly silt loam, 3 to 8 percent slopes
BvC	Buchanan very stony silt loam, 0 to 12 percent slopes
CcB2	Catoctin channery silt loam, 3 to 8 percent slopes, moderately eroded
CcC2	Catoctin channery silt loam, 8 to 15 percent slopes, moderately eroded
CcC3	Catoctin channery silt loam, 8 to 15 percent slopes, severely eroded
CcD2	Catoctin channery silt loam, 15 to 25 percent slopes, moderately eroded
CcD3	Catoctin channery silt loam, 15 to 25 percent slopes, severely eroded
CcE3	Catoctin channery silt loam, 25 to 35 percent slopes, severely eroded
Ck	Chewacla silt loam
CoA2	Conestoga silt loam, 0 to 3 percent slopes, moderately eroded
CoB2	Conestoga silt loam, 3 to 8 percent slopes, moderately eroded
CoB3	Conestoga silt loam, 3 to 8 percent slopes, severely eroded
CoC2	Conestoga silt loam, 8 to 15 percent slopes, moderately eroded
CoC3	Conestoga silt loam, 8 to 15 percent slopes, severely eroded
CoD3	Conestoga silt loam, 15 to 25 percent slopes, severely eroded
CrA	Croton silt loam, 0 to 3 percent slopes
CrB2	Croton silt loam, 3 to 8 percent slopes, moderately eroded
Du	Dunning silty clay loam
EcB	Edgemont channery loam, 3 to 8 percent slopes
EcC	Edgemont channery loam, 8 to 15 percent slopes
EcD2	Edgemont channery loam, 15 to 25 percent slopes, moderately eroded
EhB	Edgemont very stony loam, 0 to 8 percent slopes
EhD	Edgemont very stony loam, 8 to 25 percent slopes
EhE	Edgemont very stony loam, 25 to 70 percent slopes
GcA	Glenelg silt loam, 0 to 3 percent slopes
GcB2	Glenelg silt loam, 3 to 8 percent slopes, moderately eroded
GcC	Glenelg silt loam, 8 to 15 percent slopes
GcC2	Glenelg silt loam, 8 to 15 percent slopes, moderately eroded
GnA	Glenville silt loam, 0 to 3 percent slopes
GnB	Glenville silt loam, 3 to 8 percent slopes
Gu	Guthrie silt loam
HcA2	Highfield channery silt loam, 0 to 3 percent slopes, moderately eroded
HcB2	Highfield channery silt loam, 3 to 8 percent slopes, moderately eroded
HcC2	Highfield channery silt loam, 8 to 15 percent slopes, moderately eroded
HcC3	Highfield channery silt loam, 8 to 15 percent slopes, severely eroded
HcD	Highfield channery silt loam, 15 to 25 percent slopes
HcD3	Highfield channery silt loam, 15 to 25 percent slopes, severely eroded
HhB	Highfield and Catoctin very stony loams, 0 to 8 percent slopes
HhD	Highfield and Catoctin very stony loams, 8 to 25 percent slopes
HhE	Highfield and Catoctin very stony loams, 25 to 70 percent slopes
HoB2	Hollinger silt loam, 3 to 8 percent slopes, moderately eroded
HoC3	Hollinger silt loam, 8 to 15 percent slopes, severely eroded
HoD3	Hollinger silt loam, 15 to 25 percent slopes, severely eroded
KsA2	Klinesville shaly silt loam, 0 to 3 percent slopes, moderately eroded
KsB2	Klinesville shaly silt loam, 3 to 8 percent slopes, moderately eroded
KsB3	Klinesville shaly silt loam, 3 to 8 percent slopes, severely eroded
KsC2	Klinesville shaly silt loam, 8 to 15 percent slopes, moderately eroded
KsC3	Klinesville shaly silt loam, 8 to 15 percent slopes, severely eroded
KsD3	Klinesville shaly silt loam, 15 to 25 percent slopes, severely eroded
KsE3	Klinesville shaly silt loam, 25 to 35 percent slopes, severely eroded
Lo	Lamington silt loam
LdA2	Lansdale loam, 0 to 3 percent slopes, moderately eroded
LdB2	Lansdale loam, 3 to 8 percent slopes, moderately eroded
LdB3	Lansdale loam, 3 to 8 percent slopes, severely eroded
LdC2	Lansdale loam, 8 to 15 percent slopes, moderately eroded
LdC3	Lansdale loam, 8 to 15 percent slopes, severely eroded
Le	Lawrence silt loam
LgB2	Legore channery silt loam, 3 to 8 percent slopes, moderately eroded
LgC2	Legore channery silt loam, 8 to 15 percent slopes, moderately eroded
LgC3	Legore channery silt loam, 8 to 15 percent slopes, severely eroded
LgD3	Legore channery silt loam, 15 to 25 percent slopes, severely eroded
LgE3	Legore channery silt loam, 25 to 35 percent slopes, severely eroded
LhA	Lehigh silt loam, 0 to 3 percent slopes
LhB2	Lehigh silt loam, 3 to 8 percent slopes, moderately eroded
LtB3	Lehigh silt loam, thin solum variant, 3 to 8 percent slopes, severely eroded
LtC3	Lehigh silt loam, thin solum variant, 8 to 15 percent slopes, severely eroded
LvB	Lehigh very stony silt loam, 0 to 10 percent slopes
MaB2	Manor loam, 3 to 8 percent slopes, moderately eroded
MaC2	Manor loam, 8 to 15 percent slopes, moderately eroded
MaC3	Manor loam, 8 to 15 percent slopes, severely eroded
MaD3	Manor loam, 15 to 25 percent slopes, severely eroded
Me	Melvin and Lindside silt loams
MoA	Montalto silt loam, 0 to 3 percent slopes
MoB2	Montalto silt loam, 3 to 8 percent slopes, moderately eroded
MoC2	Montalto silt loam, 8 to 15 percent slopes, moderately eroded
MsB	Montalto very stony silt loam, 0 to 8 percent slopes
MsD	Montalto very stony silt loam, 8 to 25 percent slopes
MsE	Montalto very stony silt loam, 25 to 50 percent slopes
MtA2	Mount Lucas silt loam, 0 to 3 percent slopes, moderately eroded
MtB2	Mount Lucas silt loam, 3 to 8 percent slopes, moderately eroded
MtC2	Mount Lucas silt loam, 8 to 15 percent slopes, moderately eroded
MuA	Mount Lucas silt loam, moderately wet, 0 to 3 percent slopes
MuB	Mount Lucas silt loam, moderately wet, 3 to 8 percent slopes
MvA2	Myersville silt loam, 0 to 3 percent slopes, moderately eroded
MvB2	Myersville silt loam, 3 to 8 percent slopes, moderately eroded
MvC2	Myersville silt loam, 8 to 15 percent slopes, moderately eroded
MvC3	Myersville silt loam, 8 to 15 percent slopes, severely eroded
MvD	Myersville silt loam, 15 to 25 percent slopes
MvD3	Myersville silt loam, 15 to 25 percent slopes, severely eroded
PeA2	Penn silt loam, 0 to 3 percent slopes, moderately eroded
PeB2	Penn silt loam, 3 to 8 percent slopes, moderately eroded
PeB3	Penn silt loam, 3 to 8 percent slopes, severely eroded
PeC2	Penn silt loam, 8 to 15 percent slopes, moderately eroded
PeC3	Penn silt loam, 8 to 15 percent slopes, severely eroded
PeD2	Penn silt loam, 15 to 25 percent slopes, moderately eroded
RaA	Readington silt loam, 0 to 3 percent slopes
RaB2	Readington silt loam, 3 to 8 percent slopes, moderately eroded
RdA	Readington and Wiltshire silt loams, 0 to 3 percent slopes
RdB2	Readington and Wiltshire silt loams, 3 to 8 percent slopes, moderately eroded
ReA2	Reaville shaly silt loam, 0 to 3 percent slopes, moderately eroded
ReB2	Reaville shaly silt loam, 3 to 8 percent slopes, moderately eroded
ReB3	Reaville shaly silt loam, 3 to 8 percent slopes, severely eroded
ReC3	Reaville shaly silt loam, 8 to 15 percent slopes, severely eroded
RhA	Rohrersville silt loam, 0 to 3 percent slopes
RhB	Rohrersville silt loam, 3 to 8 percent slopes
RmB	Rohrersville very stony silt loam, 0 to 8 percent slopes
Ro	Rowland silt loam
SsB2	Steinsburg sandy loam, 3 to 8 percent slopes, moderately eroded
SsB3	Steinsburg sandy loam, 3 to 8 percent slopes, severely eroded
SsC2	Steinsburg sandy loam, 8 to 15 percent slopes, moderately eroded
SsC3	Steinsburg sandy loam, 8 to 15 percent slopes, severely eroded
SsD3	Steinsburg sandy loam, 15 to 25 percent slopes, severely eroded
WaA	Watchung silt loam, 0 to 3 percent slopes
WaB	Watchung silt loam, 3 to 8 percent slopes
WcA	Watchung very stony silt loam, 0 to 8 percent slopes
Wd	Wehadkee silt loam
WoA	Worsham silt loam, 0 to 3 percent slopes
WoB	Worsham silt loam, 3 to 8 percent slopes

Soil map constructed 1966 by Cartographic Division, Soil Conservation Division, USDA, from 1957 aerial photographs. Controlled mosaic based on Pennsylvania plane coordinate system, south zone, Lambert conformal conic projection, 1927 North American datum.

ADAMS COUNTY, PENNSYLVANIA
CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads

- Dual
- Good motor
- Poor motor
- Trail

Highway markers

- National Interstate
- U. S.
- State or county

Railroads

- Single track
- Multiple track
- Abandoned

Bridges and crossings

- Road
- Trail, foot
- Railroad
- Ferry (FY)
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings

- School
- Church
- Station

Mines and Quarries

Mine dump

Pits, gravel or other

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

BOUNDARIES

- National or state
- County
- Township or range, U. S.
- Reservation
- Land grant
- Small park, cemetery, airport

DRAINAGE

Streams

- Perennial
- Intermittent, unclassified

Canals and ditches (CANAL / DITCH)

Lakes and ponds

- Perennial
- Intermittent

Wells, water (flowing)

Springs

Marsh

Wet spot

Alluvial fan

Drainage end

RELIEF

Escarpments

- Bedrock
- Other

Prominent peak

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully